

Dental Digest

July 1954

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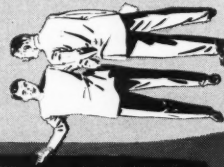


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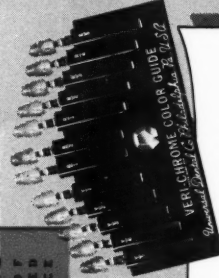


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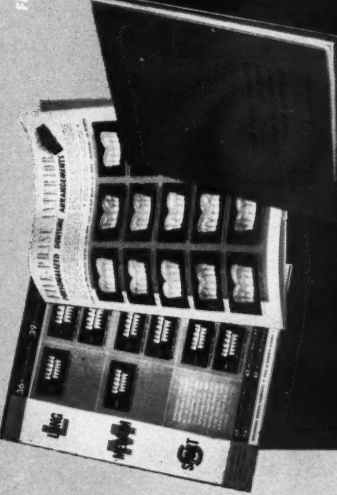
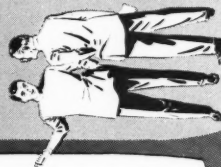
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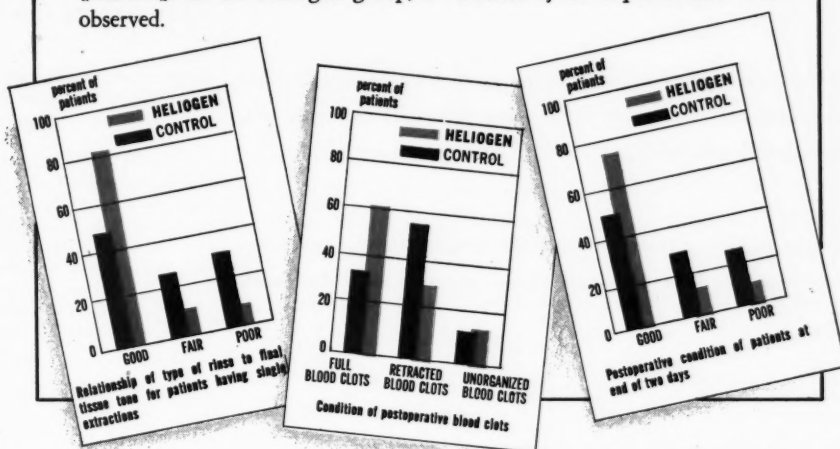


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* "A preliminary report on the comparative adjunctive healing values of two aqueous oral rinses in exodontic procedures": New York State Dent. J. (May) 1954.



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Dental Digest

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MERWIN B. MASSOL.....Publisher
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DOROTHY STERLING.....Promotion Manager
S. M. STANLEY.....Vice Pres.-Eastern Manager
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Manuscripts and editorial correspondence should be addressed to the Editorial Office.

SUBSCRIPTIONS—In the United States, Alaska, Canada, Cuba, Hawaiian Islands, Mexico, Puerto Rico, Central and South America, Philippine Islands: One year, \$5; two years, \$8.00; three years, \$11.50. Three-year subscription includes the chart book, *Visual Education in Dentistry*. Elsewhere: One year, \$5.75; two years, \$9.50; three years, \$13.75. Subscriptions payable in advance.

ADDRESS CHANGES—Please allow two weeks for address change to become effective; furnish old as well as new address.

PUBLICATION DATE—The magazine is mailed on the fifteenth of month of issue.

EXTENSION SERVICES—*Visual Education in Dentistry*, printed in full color, in DENTAL DIGEST page size. Includes 31 charts from the series, *Visual Education in Dentistry*. Prices: \$1.50 per copy to DENTAL DIGEST subscribers; \$2.50 per copy to non-subscribers; \$1.50 per copy with new subscriptions at the rates named above. *Ryan Examination and Treatment Records*, carrying an anatomically accurate chart with space for examination data, lithographed on durable paper of proper texture for crayon, pencil, or ink. Price \$1.50 per pad of 50, punched for standard loose-leaf binder. *The Castle That Was Destroyed* (published in May, 1939), Price 100, \$15. *Your Teeth and Your Life* booklet. Prices: 20, \$1; 100, \$4. *Clinics on Paper* booklet. Includes 100 suggestions from "Clinical and Laboratory Suggestions" department; 64 pages. Price: \$1.50 to DENTAL DIGEST subscribers; \$2 to non-subscribers. Information upon request.

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Dental Digest

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The magazine is mailed on the fifteenth of the month of issue.

FULL MOUTH RECONSTRUCTION

for the General Practitioner

R. P. RHEUBEN, B.D.Sc., D.D.S., Reno, Nevada

DIGEST

The need for rehabilitation of the mouth is widespread and includes the use of inlays, crowns, bridge construction, partial and full dentures. The technique for restoring balanced occlusion and vertical dimension is not unduly difficult and this article describes a procedure which is within reach of all operators. The diagnostic aspect is dealt with in a consideration of Costen's syndrome.

Diagnosis

Patients may be classified into two groups:

1. Those with discomfort
2. Those without

Symptoms Noted — In the first group all symptoms should be noted and listed. The recognition of Costen's Syndrome^{1,2,3,4,5} may be considered at this stage. It includes one or more of the following symptoms (all of them in one patient is rare):

- Tinnitus (generally a low pitched buzzing)
- Clicking of the joint
- Partial loss of hearing (when due to obstruction)
- Dizziness
- Headaches (chiefly on the crown of the head and occiput)
- Glossodynia (burning or tingling of tongue)
- Metallic taste
- Herpes of external ear

¹Costen, J. B.: JAMA 107:252-255 (July 25) 1936.

²Costen, J. B.: Internat. J. Ortho. 22:1011-1017 (Oct.) 1936.

³Costen, J. B.: Wisconsin M. J. 44:608-610 (June) 1945.

⁴Costen, J. B.: Arch. Otolaryng. 22:554-564 (Nov.) 1935.

⁵Costen, J. B.: Arch. Otolaryng. 36:548-554 (Oct.) 1942.

Pain or tenderness near the ear and joint

The joint and ear symptoms are the most common, particularly with patients wearing full dentures.

Joint Disturbances Involved—Costen¹ found that the ear involvement was generally of a mild nature. Dizziness disappeared when the eustachian tube was inflated. In overclosure of the mandible, however, the tensor palatini was not able to open the eustachian tube when swallowing, with consequent derangement of intratympanic pressure and resultant dizziness. He also states⁵ that tinnitus is more closely related to these joint conditions than is deafness, yet occasionally audiograms show an im-

provement in hearing after the occlusion has been balanced. This is also the author's experience.

Relief Afforded Patient — While there seems to be some disagreement with Costen, the factor described should not be lightly dismissed. Experience with certain cases has been such that, regardless of any explanation, relief to the patient has been phenomenal. Further informative references^{6,7,8,9,10,11,12} are recommended for those who would like to go into greater detail on this aspect of the

⁶Beyers, M. R., and Teich, S.: AMA Arch. Int. Med. 90:389-391 (Sept.) 1952.

⁷Greer, Cecil, and Withers, Bent: Texas Reports on Biology and Medicine No. 1. 6:23-33.

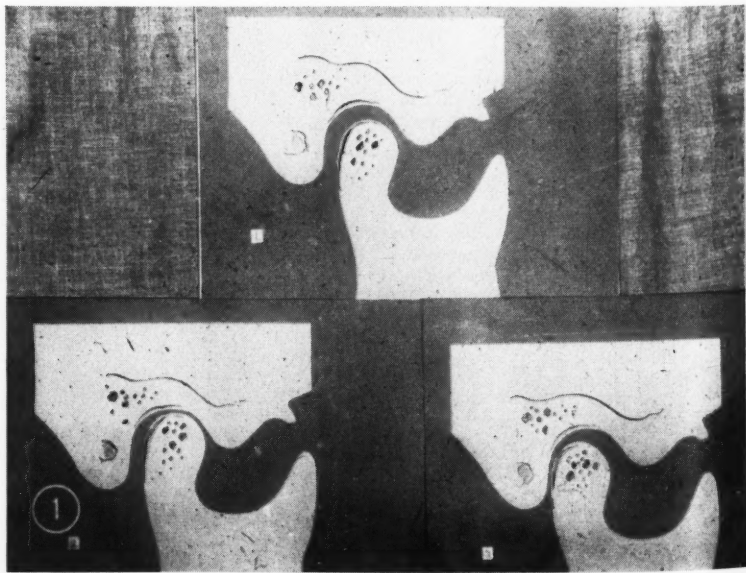
⁸Goodfriend, David J.: Arch. Otolaryng. 46:1-24 (July) 1947.

⁹Hutcherson, J. K.: Kentucky Med. J. 39:523-526 (Dec.) 1941.

¹⁰Emenhiser, Leek: J. Oklahoma Med. Assoc. 32:256-260 (July) 1939.

¹¹Tyler, A. F.: Nebraska State M. J. 23:333-336 (Sept.) 1938.

¹²Kelly, Wm. J., and Langheinz, H. W.: Arch. Otolaryng. 45:191-204 (Feb.) 1947.



1. Upper: normal. Lower left: vertical pressure. Lower right: overclosure with diminished posterior space.

problem. In any case these joint disturbances call for rare discernment and careful diagnosis.

Cooperation with Specialist of Value—It is wise to cooperate with an ear, nose and throat specialist, particularly when ear symptoms are present. Audiograms before and after treatment are informative and valuable but there are certain types of deafness where no improvement can be expected and these are in the majority.

Joint X-rays

Good x-rays of the temporomandibular joint are difficult to secure and difficult to interpret. For the inexperienced operator the position of the condyle in the fossa can be noted and an approximate normal can be considered when the space posterior to the condyle head is twice as great as the space anterior to it, in the closed position. Loss of posterior teeth on one side sometimes allows the head of the condyle to increase upward pressure with resultant decrease of space above it (Fig. 1).

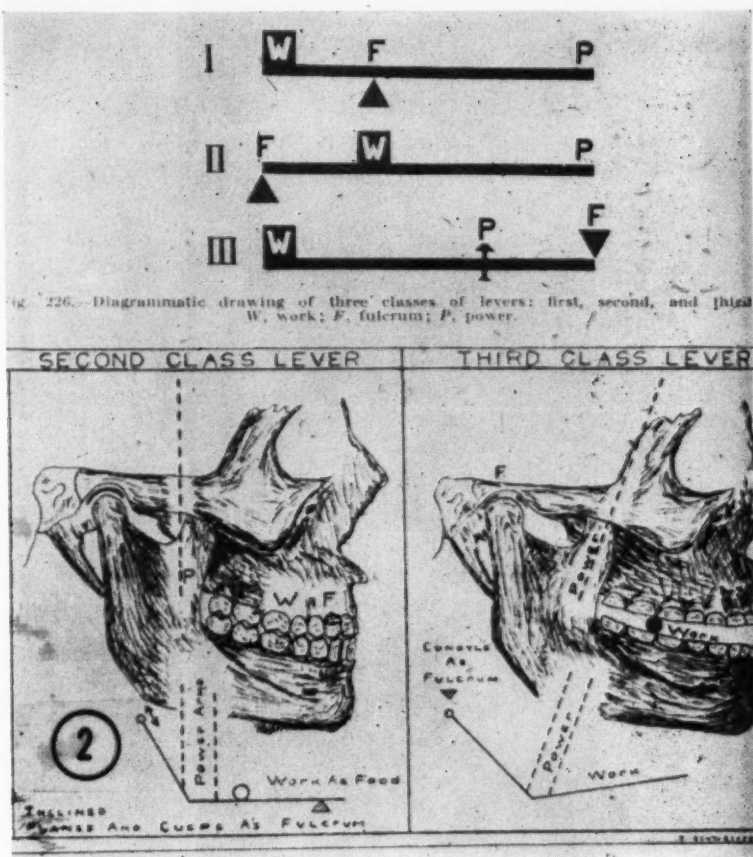
Usefulness of Third Molar

The loss of the third molar can readily be considered as the first step in the derangement of the lever system which tends to increase the pressure on the temporomandibular joint (Figs. 2 and 5).

Increased Pressure on Joint—The loss of two adjacent molars (Fig. 3) with possibly another bicuspid, results in a lever system with a greatly increased pressure on the joint.

Third Molar Acts as Fulcrum—This important function of the third molar is one which hitherto has been largely overlooked. The position of the third molar in the arch (Fig. 4) is eminently suited to act as a stop or a fulcrum almost in a direct line with the muscles of mastication.

Future Function a Consideration—The protection afforded the joint is obvious. Of course it has been noted for a long time that the use of the third molar as a distal support for a partial denture is of great value. It would seem, therefore, that consideration should be given at all times be-



2. The mandible as a lever of second and third class.

fore removing indiscriminately any good, healthy, well-rooted third molar whose function may be a future asset.

Increase in Condylar Inclination—Observation so far leads to the belief that where teeth have been missing on one side for a long time there is a definite increase in condylar inclination (Fig. 3). It may be purely coincidental or it may be due to the increase in the pressure causing a thinning of the meniscus or a deepening of the glenoid fossa.

Additional Confirmation Sought—This point (possible deepening of the glenoid fossa) is brought up in the hope that others who have similar cases will make study models and mount them on the articulator with a protrusive check bite to determine if the affected side does have an increase in condylar guidance over the normal side. An exchange of data on this hypothesis would be valuable so

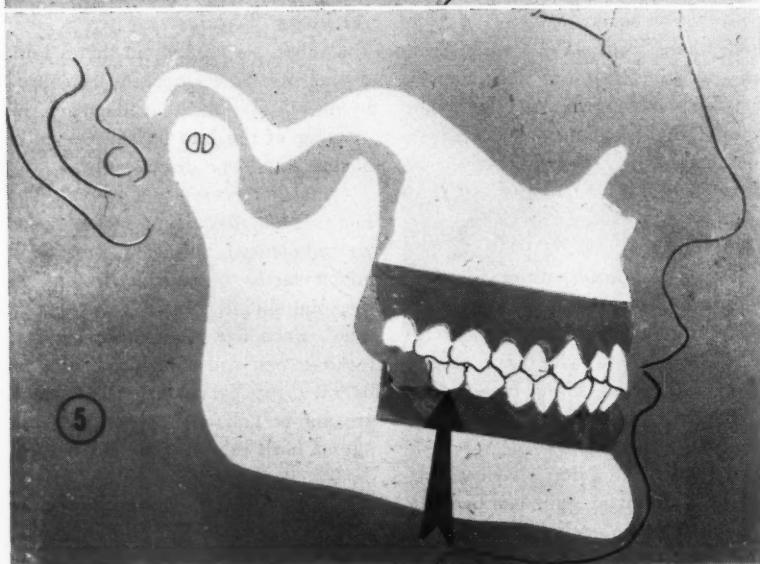
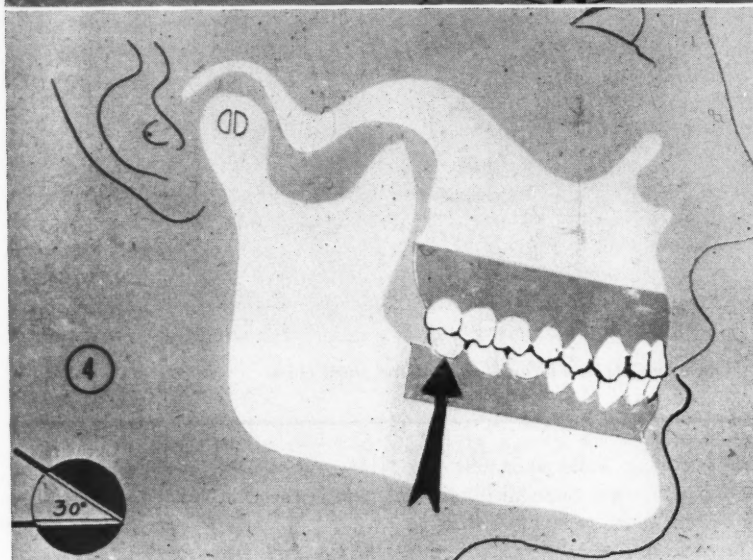
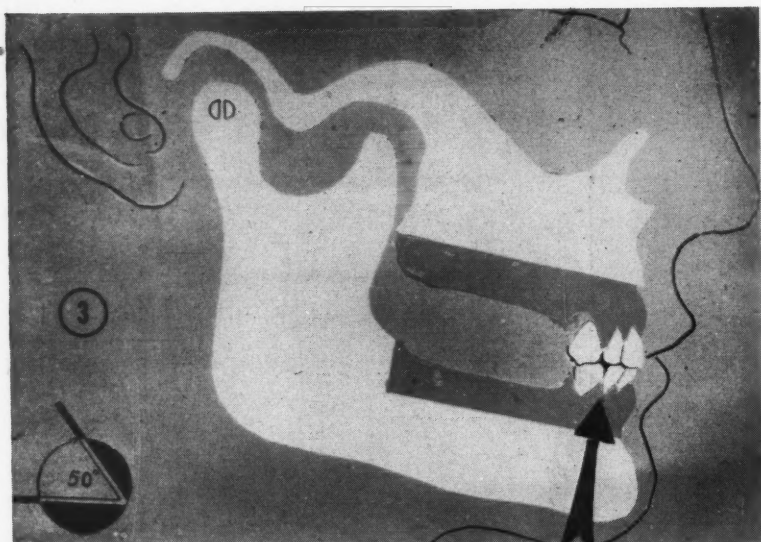
that the theory can eventually be either proved or refuted.

Bite-Raising not Always Necessary

It might be pointed out that a joint disturbance is not necessarily caused by overclosure and that ill-considered opening of the bite by several millimeters should be discouraged.

Important Factor in Trauma—The fact that a malocclusion, which means an unbalanced occlusion, can be a potent factor in causing trauma in the joint should constantly be kept in mind. Even one badly occluded restoration can cause disturbance. The lateral thrust exerted on teeth which are not in balanced occlusion is apparent both in artificial and natural dentitions.

Essentials in Treatment—Broadly speaking, patients who are free from any of the symptoms of Costen's syn-



drome present a similar reconstruction problem but usually come to the office because of extreme attrition or some similar problem with occlusion. In any case, the treatment of both classes is essentially the same:

1. Complete dental x-rays are a necessity.
2. The periodontal condition of all the teeth must be carefully noted and the depths of the gingival crevice likewise determined.
3. All uncertain teeth should be removed; this applies to any tooth which does not appear to have a useful life of approximately five years. The necessity of having to have a tooth removed within five years or so after expensive reconstruction can be extremely demoralizing to the patient.

Unusual Use of Study Models

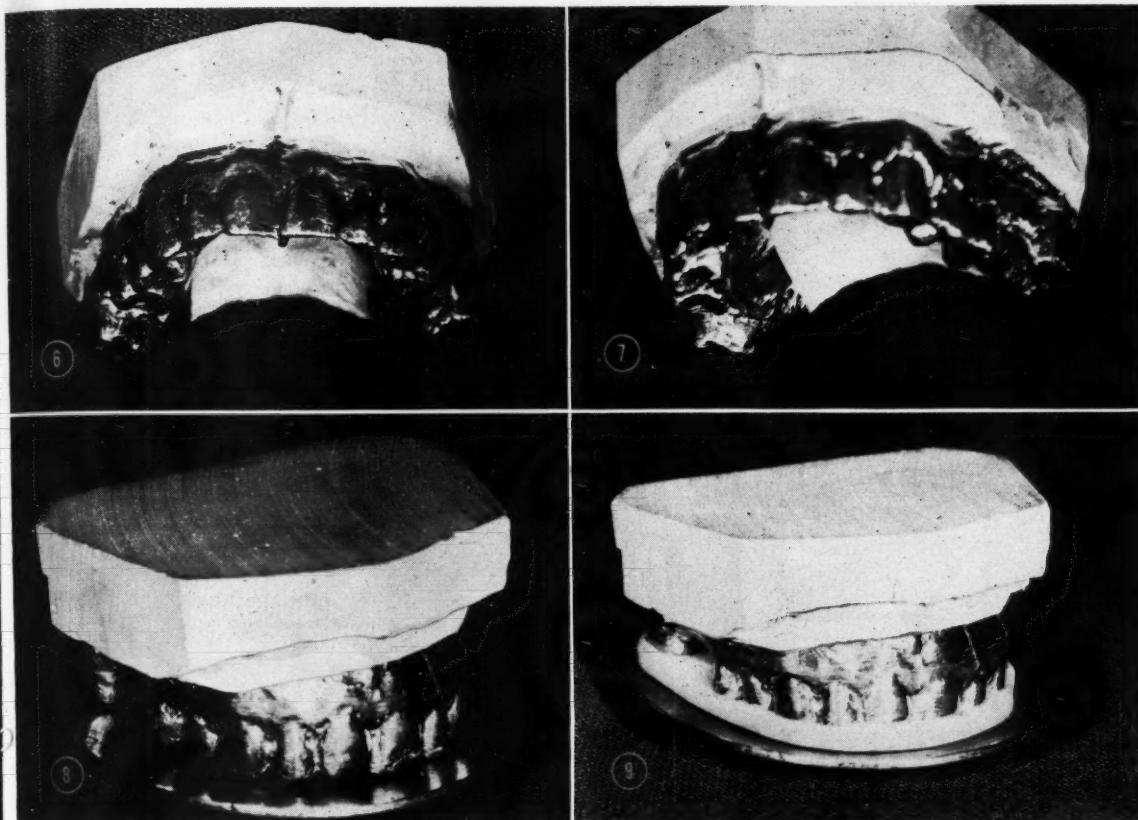
The greatest care should be taken to secure accurate study models. The following steps are included:

1. Impressions should be taken either with hydrocolloid or alginate and the models should be poured in stone.
2. The model of the maxilla should be studied carefully and the length of the teeth estimated before attrition occurred.
3. Drill a hole in the model between the two centrals and fasten a metal pin or brad with sticky wax with the point level with the proposed incisal edges (Fig. 6).
4. Place two similar pins in the second molar region with their points about level with the proposed buccal cusps of the second molars (Fig. 7)
5. Place on these three points the curved template with a four-inch radius, the one frequently used for setting up artificial teeth.
6. If an elongated tooth interferes

3. Loss of teeth increases pressure on temporomandibular joint. The glenoid fossa may be deepened with possible increase of condylar guidance.

4. The third molar is almost in line with the muscles of mastication, thus providing a stop to protect the joint.

5. Loss of third molar and each tooth progressively forward increases the pressure on the joint.



6. Metal pin between centrals indicates position of incisal edge before it was worn down.

7. Pins placed at buccal cusps of second molars. Points corresponding to correct preworn position in the plane of occlusion.

8. Points of three pins all touch the curved template, thus establishing the plane of occlusion.

9. When the model is pressed on a roll of acrylic dough so that the three pins make contact with the template, the curved acrylic surface will be the new plane of occlusion.

with the positioning of the three points (Fig. 8) reduce it. (Prior reduction in the mouth is advised.)

Plane of Occlusion

An arbitrary plane of occlusion is represented and every effort should be made to achieve reasonable accuracy:

1. When the impressions are taken check the line from second molar to second molar so that it is parallel to a line between the pupils of the eye; if it is not, take measurements after the study models are prepared, so that the two pins in the molar region will be correctly placed on the study model.

2. Tin-foil the teeth on the model and place a roll of self-curing resin which is in the doughy stage over the teeth and pins.

3. Seat the curved template so that the three pins touch it and the dough is in flat contact with the template along the entire plane of occlusion (Fig. 9).

4. When the acrylic has almost set, remove it and replace it carefully in position so that it can be taken off and replaced on the model quite easily after it has set.

5. Make the lower model and tin-foil as before. Mold self-curing resin to cover the anterior teeth only, leaving the labial surfaces almost uncovered; the dough may be extended along the lingual surfaces of the posterior teeth but not on the occlusal.

6. After the resin has set, trim the acrylic over the incisal edges of the anteriors until the height corresponds with the original incisal edges before they were worn down.

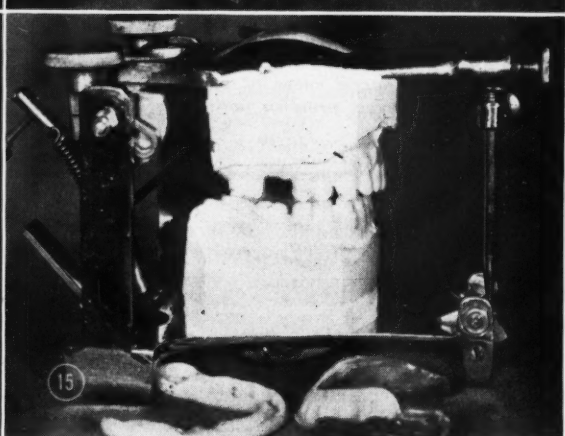
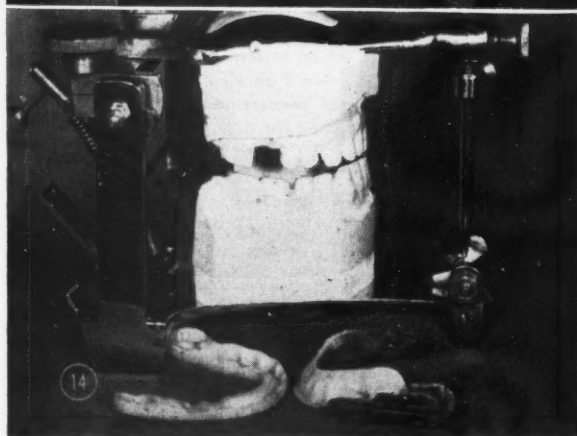
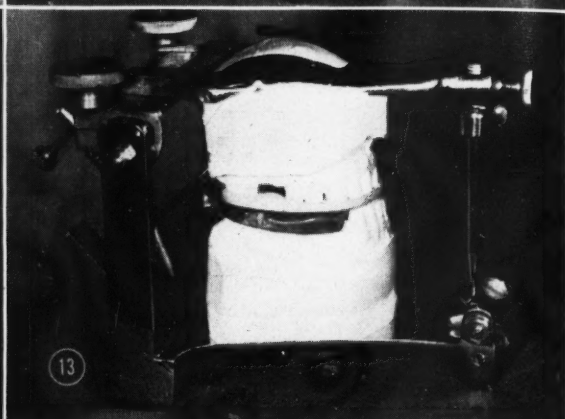
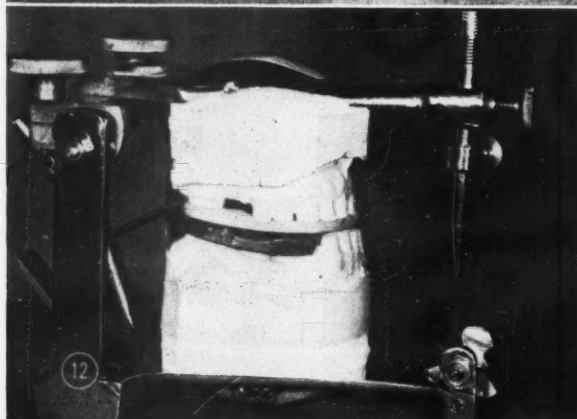
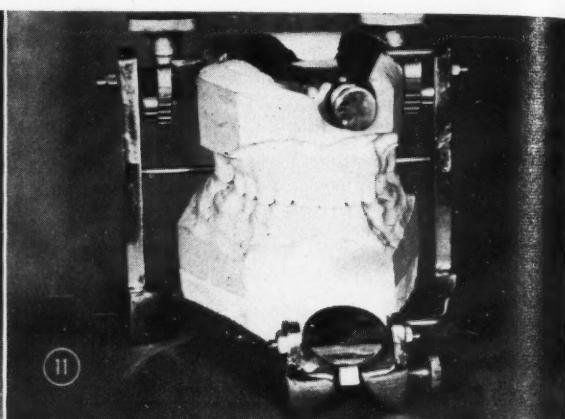
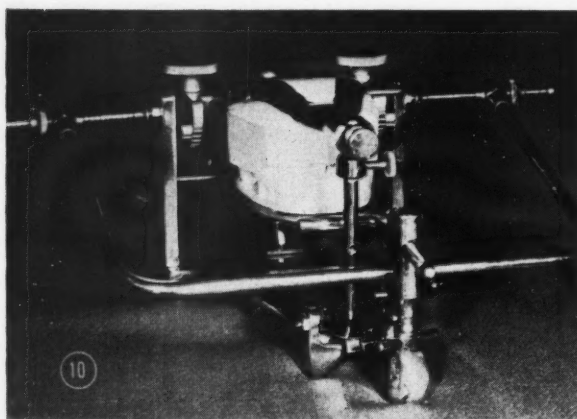
7. Ordinary baseplate wax may be used to cover the tin-foil on the posteriors somewhat in the nature of a bite-block which it virtually is. The excess tin-foil is trimmed off.

Use of the Facebow

The facebow may be used for the reason that the hinge of the articulator will roughly correspond to the hinge condyle of the mandible. If it is necessary to open or close the bite on the articulator discrepancies are less likely to occur.

The acrylic block (Fig. 10) which has been molded over the upper model will be an excellent foundation on which to attach the facebow fork.

The upper model is transferred to the articulator with the plane of occlusion approximately parallel to both upper and lower bows.



10. The acrylic block is an excellent foundation for use with the facebow.

11. The minimum for any articulator should be adjustable condyle paths and adjustable incisal guidance.

12. The protrusive bite necessary for registering condylar guidance.

13. In protrusive the condylar guidance is adjusted and the incisal guide pin is brought down and locked in place.

14. With bite-blocks removed the incisors are separated only by the amount of attrition which has occurred.

15. In centric the space must be restored to normal occlusion.

Articulation

It is important that the articulator (Fig. 11) should have as a bare minimum: (1) adjustable condyle paths, and (2) adjustable incisal guidance.

In many cases the models will go together in centric occlusion but, if not, centric occlusion may be registered with a thin sheet of soft wax. The

lower model is mounted on the articulator in centric occlusion with the upper, the bite-blocks having previously been removed and set aside.

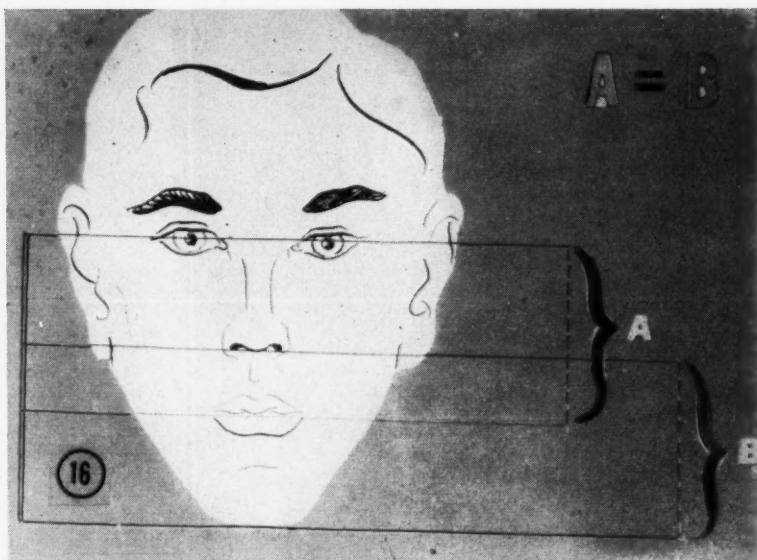
Protrusive Check-bite Important

The bite-blocks are now ready to be transferred to the mouth for the purpose of registering a protruded bite with the built-up incisal edges coming together in the edge-to-edge position (Fig. 12). This is one of the most important procedures in securing good functional occlusion and cannot be too strongly emphasized:

1. While in the mouth, the lower may be trimmed, if necessary in the anterior region to correspond with the upper.

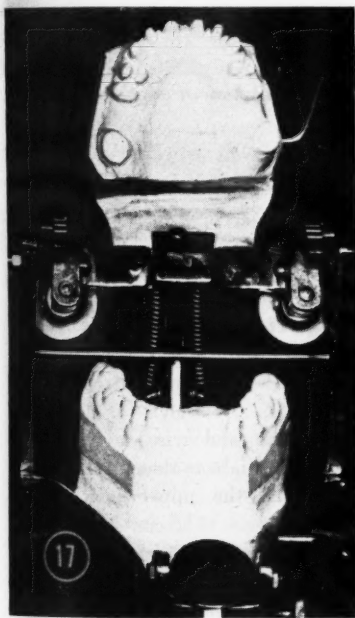
2. More wax is added to the posterior part of the lower and the patient is requested to close in protrusion on the softened wax. The edges are notched or otherwise marked to aid in reassembling.

Incisal Guidance Adjusted on the



16. For facial harmony A equals B.

17. All teeth were prepared except lower incisors (this was not necessary in this case).



Articulator—1. Adjustment is done arbitrarily, basing the angle on the conditions present. A young patient with good supporting bone can stand a little more angle than an older patient whose cusps would normally be flatter; trauma is also avoided.

2. The angle is kept between 10 and 25 degrees, provided this is compatible with the condyle paths and the plane of occlusion.

3. Generally speaking, correct cen-

tric occlusion plus an accurately recorded protruded bite will provide the general practitioner the basis for a fairly accurate functional occlusion.

4. For further accuracy it is clear that a Gothic arch tracing could be taken by using these bite-blocks as well as lateral check bites.

Condyles Adjusted—After mounting the models, the condylar guidance should be slacked off, the bite-blocks placed on the models and brought to their position in protrusive relationship. The condyles are then adjusted accordingly and the incisal pin is brought down to contact (Fig. 13). The bite-blocks are removed and the working of the articulator is examined.

Articulator to Function as Jaws in New Position

In the edge-to-edge position the anteriors (Fig. 14) should be separated only by the amount which has previously been determined from wear.

Preliminary Bite Opening—When the articulator is placed in centric (Fig. 15) in most cases it will be noted that the teeth are separated. This separation will differ in each case and will serve as a basis for the amount of opening necessary for re-

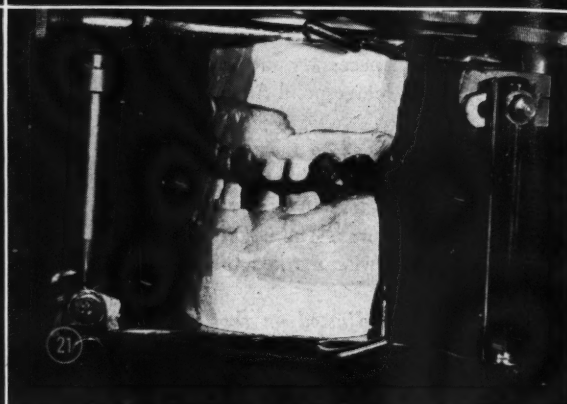
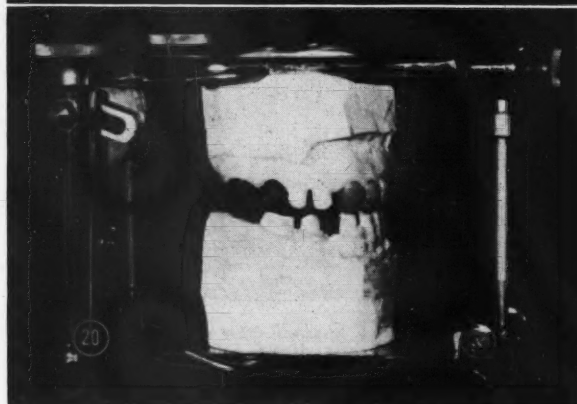
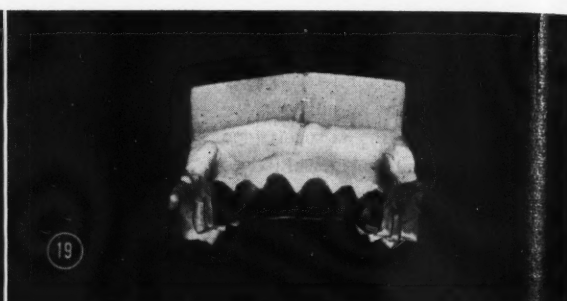
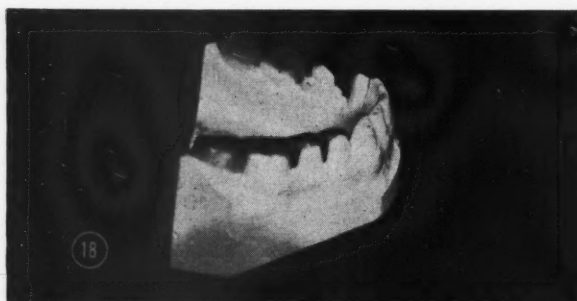
storing a balanced occlusion; in other words, this is a preliminary opening of the bite.

Procedure—1. The patient's physiologic rest position will reveal how much freeway space is present. When the lips are in repose and the muscles at rest the teeth should be separated by a few millimeters (usually about 3 millimeters).

2. At this time also it may be helpful to take the facial measurements as described by Goodfriend;⁸ namely, the distance from the pupil of the eye to the corner of the mouth should approximate that from the nose to the chin (Fig. 16).

3. If considerable increase in vertical dimension is required, it is wise to construct splints for the patient to wear a few weeks at a time, in stages, until an adequate minimum of vertical dimension has been restored. The use of self-curing resin cemented with wondrpak will be found a useful medium in making temporary splints.

4. Again it must be emphasized that the vertical dimension should not be increased beyond the requirements for the case under consideration (1) with due regard for the joint condition, (2) restoring of a balanced occlusion, (3) the freeway space, and



18. Self-curing acrylic set with zinc oxide paste protects the preparations.

19. Waxing for acrylic restorations. Porcelain jackets may

be made after setting the inlays.

20. Waxing is done to secure balanced occlusion.

21. Balance in protrusive.

(4) the proper facial proportions.

Value of Preliminary Survey—The procedure described may seem to involve unnecessary effort in a preliminary survey but it can in effect be a time-saver. The bite-blocks can be used for the final case and with the articulator at the chair its movements will indicate where to grind and where not to grind, thus actually conserving time and effort for the operator and the patient. Its value in demonstration to the patient is self-evident.

Preparation of Abutment Teeth

In some cases there will be no necessity to build up both upper and lower anteriors; frequently the lowers are but little worn while the lingual surface and part of the incisal of the uppers has stood the brunt of attrition. Usually the posterior teeth are best restored by MOD inlays, three-quarter crowns or full crowns; three-quarter crowns being the choice for

abutments for fixed bridges (Fig. 17).

Esthetics Consulted in Anteriors—Some teeth will need porcelain jackets or acrylic jackets while others can have thin three-quarter crowns or pin inlays for their lingual surfaces.

Number of Restorations Determined by Conditions—In some cases it is preferred to make the anterior restorations after the posteriors have all been set. The number of teeth to be prepared at one time can be decided by the conditions present. Every preparation should be thoroughly dried and examined for possible defects.

Construction of Splint—When one quadrant is finished the preparations are usually protected and comfort is provided for the patient by constructing a splint of self-curing acrylic which is set with wondrpak or zinc oxide paste (Fig. 18).

The Impressions

The hydrocolloid technique similar

to that advocated by Thompson and others is used.

Mounting the Models

1. Examine the models carefully and decide which will be used on the articulator and which for dies.

2. Clean and trim and let them stand overnight to dry.

3. Take the upper acrylic bite-block and see if it can be placed in position on the model using the utmost care not to injure the model.

4. If the acrylic binds, relieve it with a bur, fill in with soft wax, transfer to the mouth, and push up into place. The resultant wax-lined bite-block should go to place on the model.

5. During this procedure it must be remembered to keep this acrylic bite-block in the same relative position on this model as it occupied on the study model (Fig. 9).

6. The same procedure is completed with the lower bite-block. Centric and protrusive are taken as previously described.

7. After mounting the models, place the bite-blocks in position and bring them into their protrusive relationship with the incisal guidance pin slacked off.

8. The condyle angles should be the same; the incisal guide pin can now be brought down to make contact with the plane which is kept with the same setting as before (Fig. 13).

9. Remove the bite-blocks and check the working of the articulator; it should be similar to that of the study models. *If in doubt, make wax bite-blocks and verify them in the mouth.*

Exact Replica of Mouth

Accurate facsimiles of both jaws which are able to simulate natural movement should now have been attained. It will be noted that the protrusive or edge-to-edge position of the incisors will exactly correspond with their bite-opened position (if any) while the centric will provide the increased vertical dimension necessary to obtain balanced occlusion.

Biologic Factors—Granger¹³ states "The cusps required in any given case will depend on the condyle path, occlusal plane, curve of Spee and incisal guidance, all of which are biologic factors."

Physiologic Guide—Granger further states, "Decreasing anterior guidance and increasing the curve of Spee will reduce the cusp height. Here then is the physiologic guide to vertical dimension." This succinct statement is worth noting.

Waxing and Finishing

1. Microfilm or similar lubricant is used for the teeth on the articulator as well as the dies. Wax the lower posteriors on the dies, transfer them to the teeth on the articulator and have the tips of the cusps just making contact with the curved bite-plate which has been placed on the upper

model and brought to the *protrusive* position. As a rule waxing should be done so that the cusp height is progressively less toward the posterior.

2. When all the posterior wax patterns are in place, corrections to be made will be obvious. The posterior teeth on the upper, for the same side, may be waxed and placed in position (Fig. 20).

3. In protrusive, their cusps should just touch or be in the same plane as those of the lowers (Fig. 21) while in centric there should be interdigitation with normal occlusion. To achieve this may require a certain amount of carving and replacing on the dies.

4. The lateral movements may now be observed and the planes of the cusps examined for contact moving from centric to protrusive.

Similar Procedure Completed — When satisfied with one side, the same procedure is carried out on the other side. Good contact must be maintained with all teeth in centric; make sure that none is underoccluded. If three-quarter crowns or inlays are used for the anteriors, procedure for their waxing and articulation can be completed without undue difficulty. The result should be an almost perfectly balanced occlusion which will call for little grinding when finished in the mouth.

Final Corrections Made — Make sure that all patterns have satisfactory contacts on the articulator models and transfer them to the dies for the final additions and corrections of the margins, particularly at the gingival.

Method of Casting—Casting can be accomplished with the technique of choice.

Final Grinding in Mouth—When all the teeth are in position, the occlusion can be checked before transferring to the mouth. When this is done and contacts determined, the final grinding can be done in the mouth, as for dentures, using carborundum paste with which to finish.

The castings may then be polished on the dies, set in the usual way, and rechecked after setting.

Additional Considerations

If acrylic restorations are being made for the anteriors, the waxing and finishing will be similar whether cast reinforcements are used or not (Fig. 19). If porcelain jacket crowns are being used, however, the author prefers to set all other restorations and do these last as a separate project.

Modifications — Where extensive bridge construction and partial dentures are required, modifications of the technique will be obvious.

Use of One Bite-block—In cases where little opening of the bite is required and all the anterior teeth are in good condition, it may be difficult to use two bite-blocks; in that case use a thin upper one and coat its occlusal with wax to obtain protrusive position; even hydrocolloid can be injected for check bites.

Summary

In the absence of all other pathologic conditions, the train of symptoms known as Costen's syndrome usually points to a derangement of the temporomandibular joint caused by faulty occlusion.

The technique for restoring balanced occlusion and vertical dimension is not particularly difficult. It requires care in study and planning, and accuracy in accomplishment. This accuracy must above all be observed in obtaining the protrusive and centric relationships and in carving the wax patterns as close to perfection as possible.

In the mouth the final finishing should be done with extreme care; it is easy to obtain a bite that looks right but which may have an uneven distribution of pressure.

505 Chestnut Street.

¹³Granger, Ernest R.: New York J. 2nd Dist. D. Sec. 31:5-12 (Jan.) 1945.

The UNILATERAL IMPLANT

LEONARD I. LINKOW, D.D.S., Kew Gardens Hills, Long Island

DIGEST

Since the middle of the 16th century many attempts have been made at implantation of metals and alloys into living tissue. Vitallium is at the present time the metal of choice and has been found to be completely tolerated by human bone and tissue. The detailed instructions in this article for completing a highly skilled procedure, the surgical implant, are concerned only with implants in the posterior edentulous areas of the lower jaw where there are no molars and bicuspid present. This technique is referred to as the unilateral or bilateral implant.

Fixed Bridge Construction by New Concept: Factors Involved

Patients with one or both posterior segments of the mouth edentulous frequently suggest that a fixed appliance be constructed for them. These patients must be told that a fixed bridge cannot be constructed because there are no teeth to support it in the posterior area. With the procedure described herein, however, a completely new concept can be established.

Technique Explained to Patient—Before therapy is attempted complete understanding must be established between the patient and the dentist regarding the possibilities of future success or failure of the implant.

Possibilities Clarified—The patient must be told that the technique is still in its infancy and that there may be the possibility of having to remove

the implant at a future date. This understanding should be in writing, if possible.

Preliminary Measures

Physical Examination—After the situation has been thoroughly discussed with the patient, a complete medical examination must be made. A conference with the patient's physician is advised. The physical examination should consist of a complete blood examination including bleeding and coagulation time, red blood cell and white blood cell count, hemoglobin count, and a serum calcium and serum phosphorus study. A urinalysis should also be made. All these tests should be supplemental to a thorough history taken by the physician regarding (1) past or recent illnesses, (2) any general debilitating diseases, or (3) inflammatory or vascular complications.

Dental Examination—If the patient's physical condition is favorable, the dentist should take a complete dental history including the following factors:

1. A full mouth series of x-rays.
2. Careful attention to root tips that may have been left in the bone; if present, they should be removed prior to the initial impression.
3. The roentgenogram should be examined for residual infections which must all be cleared up before any procedure is started.

Procedure Started—After everything is proved to be satisfactory, another appointment is made for the patient and procedure is begun. The procedure described is for a lower

unilateral implant which will include the two bicuspid and one or two molars. All the remaining teeth are present.

Office Procedure, First Visit

At the first visit the following steps are taken:

1. A mandibular block along with an infiltration injection is given to the patient in order to anesthetize the bicuspid tooth which will be the anterior abutment and which will be prepared for a full crown or veneer. (This is done at this time for an important reason which will be discussed later.)

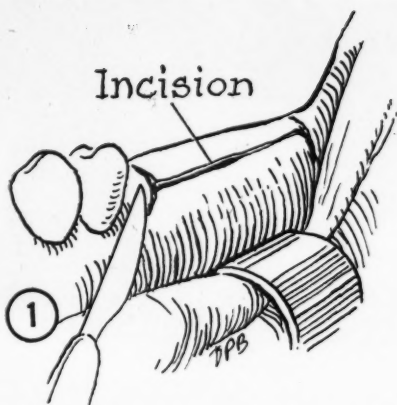
2. While the anesthetic is taking effect, a unilateral impression of the edentulous area is taken in compound or alginate and poured in stone or plaster (Fig. 1). From this a tray of acrylic or metal is made (Fig. 2). The tray should have the following specifications:

(A) The retromolar pads should be included posteriorly.

(B) Buccally, the tray should extend to about the external oblique ridge and as it goes forward it should avoid the mental foramen, being superior to it.

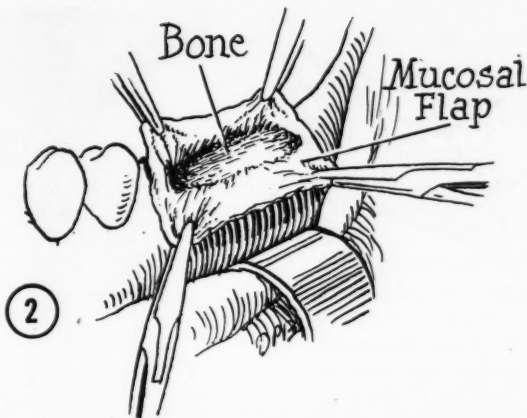
(C) Lingually, the tray should extend only about 2 millimeters below the crest of the ridge, keeping it above the superior internal border of the mandible. This tray is not completed at the first visit while the patient is seated but rather during the dentist's free time.

(D) When the anesthesia has taken full effect, the bicuspid is prepared for a full or veneer crown, covered with an aluminum shell crown, and the patient is dismissed.



1. The line of incision should start posteriorly from the retromolar pad area and proceed anteriorly along the crest of the ridge to the distoproximal surface of the bicuspid.

2, and 3. The tissue is retracted buccally and lingually, exposing the bone.



Second Visit Procedure

The following are the steps to be completed at the second visit:

1. Again the patient is given a mandibular block injection and a long buccal; the tray is tried on over the gingival tissue and is trimmed for overextensions and impingement.

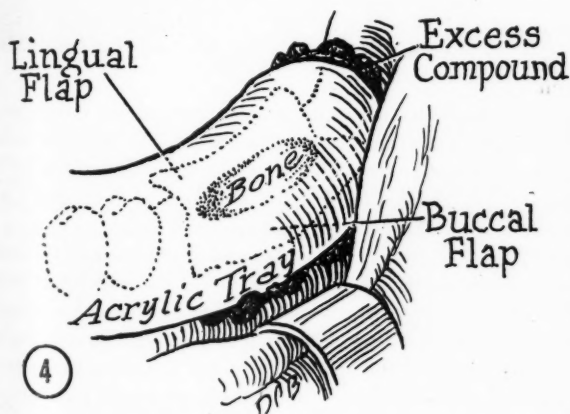
2. When the patient has all the symptoms of numbness the first surgical operation is accomplished. This is done by making an incision along the crest of the ridge which starts

posteriorly from the retromolar pad area to where the gingival tissue comes in contact with the distoproximal surface of the prepared bicuspid. At this point a lateral incision is made labially and lingually:

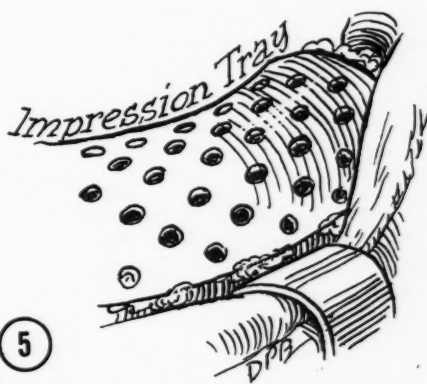
(A) Labially, the incision should extend 5 to 7 millimeters, being careful to avoid the mental foramen.

(B) Lingually, the incision should extend less than 5 to 7 millimeters.

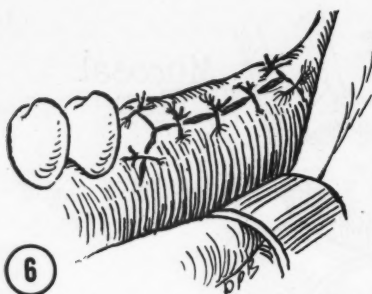
(C) Posteriorly, these lateral in-



4. A direct bone impression with soft fusing compound is taken in the acrylic tray.



5. An alginate impression is taken directly over the acrylic tray. The impression should include the previously prepared bicuspid.



6. and 7. The soft tissue is drawn back to position and sutured.

8. The Vitallium implant.

9. The implant fitted on the stone model prior to making the acrylic splint.

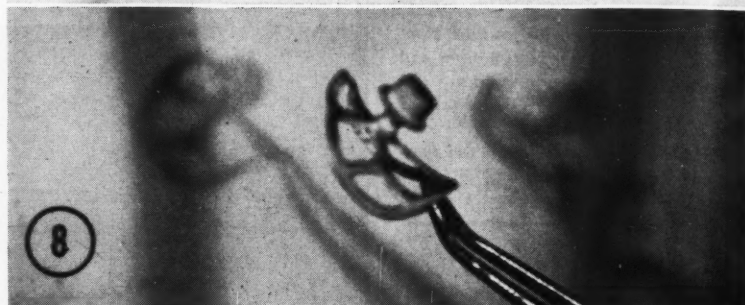
cisions should extend from the superior internal border of the mandible on the lingual to the external oblique ridge labially (Fig. 1).

3. Using a periosteal elevator, the mucoperiosteum is elevated and retracted buccally and lingually (Figs. 2 and 3). An assistant should hold back the lingual tissue while the buccal tissue is sutured to the inside of the cheek or retracted by the dentist with one hand as a direct bone impression is taken with the other hand.

4. At this time, if there seems to be an overextension or bulkiness of bone on the lingual, it is sometimes advisable to chip some of it off with a mallet and chisel or a bone bur as the lingual border of the implant might some time pierce its way through the lingual tissue. The tissue in that area is usually thin and tightly attached to the bone. Cutting away the bone in this area to take up the thickness of the implant allows the implant to be in the same plane with the bone inferior to it. In this way the tissue in the area will not be stretched.

5. Soft fusing compound, tempered to 115° Fahrenheit, is placed in the tray which has just been taken out of the sterilizer. Make sure there is no soft tissue remaining on the bone. The impression is taken (Fig. 4).

6. Care must be used to equalize the pressure anteriorly and posteriorly over the tray. The tray is removed after it has been chilled. At this time



a wash of Kerr's paste can be used although it is not necessary; at times this measure is a disadvantage as the material has a tendency to flake off and is difficult to remove from the bone.

7. The impression is carefully examined for possible "drags" or inaccuracies; if found to be satisfactory it is immediately replaced on the ridge and an alginate impression is taken directly over the impression tray. This should include the anterior abutment tooth (Fig. 5).

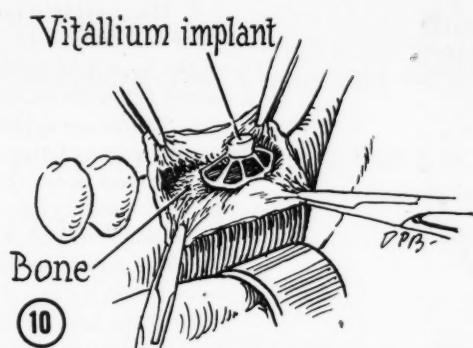
8. The entire mass is removed in

one piece and a model is immediately poured in stone. The bicuspid is included in the alginate impression so that the abutment of the implant will be made parallel to it.

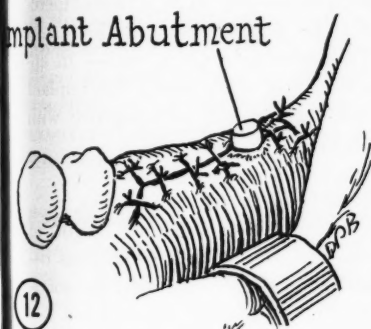
9. It is also important to measure the thickness of the soft tissue overlying the bone so that the abutment of the implant will not be constructed too high or too low from its base.

10. Sutures are placed on the approximating sides of the gingival tissue (Figs. 6 and 7).

11. The patient is advised to rest for the next day or two and is



10, and 11. The implant being fitted into correct position directly on bone with the mucosa retracted.



12. Soft tissue is sutured over the base of the implant so that only the implant abutment is seen above the mucosa. At this stage the acrylic splint is placed immediately over the implant abutment and the previously prepared bicuspid abutment.

13. An x-ray is taken after the implant has been placed in position and sutured into place.

14, and 15. The soft tissue as it appears six to eight weeks after healing has taken place. Note that only the implant abutment is seen as the base is encapsulated with the thick fibrous tissue.



given the following instructions:

(A) Ice packs should be applied on the neck and against the cheek proximating the area of operation.

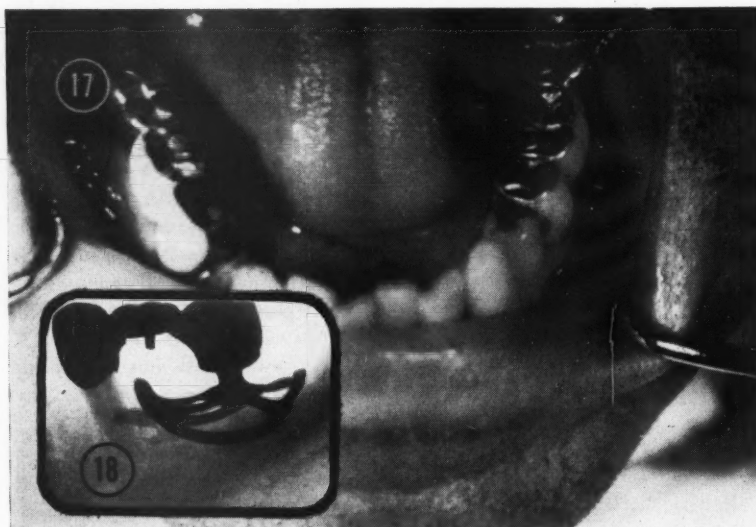
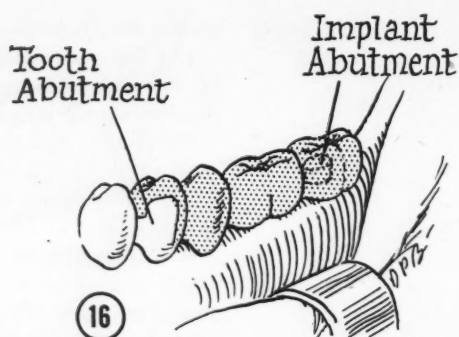
(B) Warm salt solution mouth-washes every few hours are advised.

(C) Prescriptions are given for relief of pain.

(D) It is advisable to send the patient to a physician for a prophylactic dose of penicillin (600,000) units.

12. The patient returns in five to seven days and the sutures are removed. When the implant is returned from the laboratory (Fig. 8) it is essential to make up an acrylic splint which will stabilize the implant immediately after insertion. This is done in the following manner:

(A) The metal framework is placed on the stone model (Fig. 9). Using fast setting acrylic, a bridge is constructed using the abutment of the implant posteriorly and the bicuspid,



16. and 17. Permanent bridge in place after being cemented onto implant abutment and tooth abutment.

18. X-ray showing implant with permanent bridge attached.

already prepared, on the stone model anteriorly. (This is the reason for preparing the anterior abutment previously.)

(B) The bridge can be fabricated (1) by waxing up both abutments and the pontics, taking an impression on the model with alginate, removing the wax, placing the fast setting acrylic into the alginate impression and reseating it on the model; or (2) by molding the acrylic around the abutments with a horizontal flat surface, joining them together. The bridge should be trimmed and polished.

Third Visit

When the steps outlined have been completed, the patient is called in for the insertion of the implant. The

sooner the implant is inserted after the impression has been taken, the better the chances are for success. If too much time elapses, some subperiosteal tissue may form which will affect the accuracy of the fit of the framework. If the insertion of the implant can be accomplished in two weeks, more or less, after the impression is taken, little cutting should be necessary, as the soft tissues will not have completely healed.

Insertion of Implant—The following steps are taken:

1. With a sharp scalpel an incision is made along the crest of the ridge as previously described.
2. At this time, since the tissue has not completely healed from the first operation, it should be much easier to separate the soft tissue from the bone.

3. The implant, previously sterilized and allowed to cool, is placed on the bone held in place by the assistant (Figs. 10 and 11).

4. Sutures are applied to the approximating edges of the soft tissue. As many sutures as are required to close the approximating edges as accurately as possible are used (Fig. 12).

5. The acrylic bridge is then cemented on to the two abutments. This should have been ground out of occlusion previously so that there will not be any excessive occlusal stresses on the implant during the healing process. This splint is used rather than screws which would have to penetrate the bone for retention.

Additional X-rays Taken—Several intraoral x-rays can be taken at this time in the area of the implant. The patient is once more instructed concerning postoperative care (Fig. 13).

Observation—Another appointment should be given to the patient about 48 hours later in order to examine for possible acute infection that might have developed. If conditions are found to be satisfactory at this visit, the patient should be instructed to return in about a week to remove the sutures and once a week thereafter for periodic examination.

Encapsulation Complete — In approximately eight weeks the implant should be entirely encapsulated with fibrous tissue.

Final Measures

1. After a reasonable length of time has elapsed and the fibrous tissue has filled in completely, the acrylic splint is removed (Figs. 14 and 15) and a fixed bridge is constructed using the same procedure as that employed for any typical bridge technique (Figs. 16 and 17).

2. The patient should be requested to return from time to time so that x-rays can be taken to estimate the amount of resorption of the bone under the implant (Fig. 18).

3. If there is only a small amount of resorption it is possible for the patient to have many years of satisfaction and enjoyment with this relatively new and advanced method of dentistry.

71-17 150th Street.

Indirect Method for Constructing

FIXED PARTIAL DENTURES

in Two Visits

JAMES R. DOUGLAS, D.D.S., Montgomery, Alabama

DIGEST

The dentist is interested in saving chair time in order to make dental treatment more satisfactory for the patient and to increase his income by being able to treat more patients in a specified length of time. These objectives can be accomplished by the use of the best equipment and materials available, the attainment of increased efficiency through study and experience, and the elimination of the steps in operative technique that are time consuming but unnecessary in the successful completion of the operation undertaken. An indirect technique used in the construction of a six-tooth upper anterior bridge is described in this article.

Preliminary Preparation

This technique is applicable in any area of the mouth and various types of retainers can be used. It is assumed, however, that proper selection of abutment teeth has been made in relation to condition of teeth, supporting tissues, masticating force, and types of retainers necessary for the strength of the fixed partial denture.

Procedure

The following steps are taken:

1. Three-quarter crown abutments are prepared for the right and left cuspid teeth.

2. Copper bands which have not been annealed are selected to take an impression of the abutment teeth with an elastic material (not hydrocol-

loid). The copper bands must not touch the preparation at any point. They must fit loosely so that there is room for excess material at the margins of the preparation. The bands should extend 3 millimeters above the teeth.

3. Having selected the correct bands, the elastic impression is taken of individual teeth with Dietrich elastic material. Directions for using this material, given by the manufacturer, must be followed explicitly or satisfactory results can not be expected (Fig. 1).

4. Impressions of the abutment teeth are not removed at this time.

5. A plaster impression is taken of the copper bands, edentulous area, and two or more teeth on each side of the abutment teeth (Fig. 2).

Plaster Impression Removed—It is advantageous to cut the flanges of the impression tray to approximately 3 millimeters from the occlusal surface of the tray so that excess plaster in the posterior area or in undercut areas can be trimmed before the plaster is set. Allow the plaster to set until all heat is eliminated. The plaster impression is removed with a downward pull and not a twisting movement. It is evident that the copper band impressions have been removed from the abutments and have remained in the plaster impression (Fig. 3).

Steps May be Repeated—If the copper bands are not fixed in the plaster, however; or if any part of the combination impression is not accurate, the preceding steps must be repeated. An accurate wax bite is taken, followed by a colloid impression of

the upper teeth to make an occluding model (Fig. 3). The wax bite may be used to make an occluding model.

Additional Steps—1. In pouring the stone dies it is advisable to use a stone of extra hard quality. The stone used for pouring models is not hard enough for this purpose.

2. The impression of abutment teeth should be dry before a thick mix of stone is vibrated into them.

3. Dowel pins are placed in the stone as parallel to each other as possible (Fig. 4).

4. After the dies have set for at least thirty minutes, a separating media is painted on the plaster impression and the model poured with stone leaving about 4 millimeters of the dowel pins exposed.

Final Steps—1. When the stone has hardened, cut away the plaster and place the model in boiling water for at least three minutes. This will soften the elastic impression material in the bands and allow easy removal of bands without fracturing the stone dies. The stone dies can be pushed out of the models if desired at this time (Fig. 5).

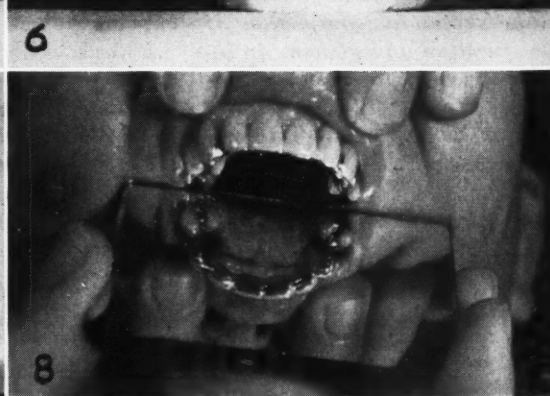
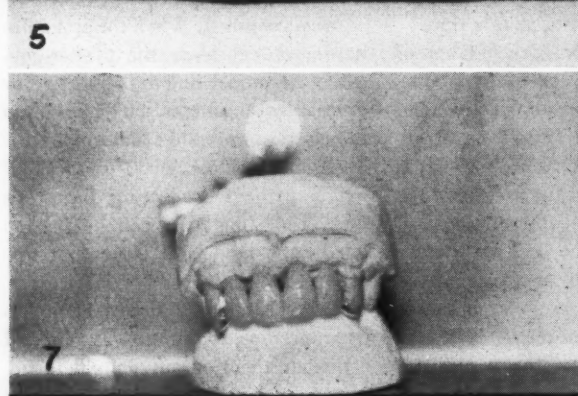
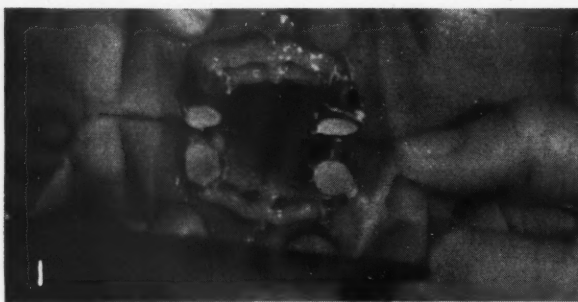
2. Place upper and lower models in proper position in the wax bite and articulate them on any suitable articulator, making certain not to cover the dowel pins with plaster.

3. Since an exact duplication of the abutment teeth and edentulous area has been made, the bridge can now be completed on the articulated model by any accepted method (Figs. 6, and 7).

4. On the patient's second visit, the fixed partial denture is cemented in place (Fig. 8).

Summary of Advantages

An indirect fixed partial denture



- 1.** Copper band impressions of abutment teeth using elastic impression material.
- 2.** Plaster impression of copper bands, edentulous area and two or more teeth on each side of abutment teeth.
- 3.** Combination impression and bite.
- 4.** Copper band impressions poured and dowel pins in

- place. Plaster impression is ready for stone to be poured.
- 5.** Dies separated from the stone model.
- 6.** Dies and stone model articulated and waxing of dies finished.
- 7.** Completed bridge placed on articulator.
- 8.** Completed bridge cemented in place.

constructed in the manner described has, among others, the following advantages:

1. The elastic impression material will push aside, with the aid of the

band, the gingival tissue and provide an excellent impression of the abutment teeth, even though some seepage of saliva and slight hemorrhage may be present.

2. In acquiring a model on which the bridge is constructed, plaster impression material is used, making certain that the distance between the abutment teeth is accurate. Plaster

has proved to be a satisfactory material for this purpose.

3. The dentist will encounter little difficulty with his operative procedure since only minor changes are made

from his established techniques.

4. It is not necessary to buy special material and equipment. Most operators have used the materials mentioned for many years.

5. The patient is saved at least one trip to the dental office, and the dentist has saved chair time.

626 Ann Street.

Fortified Foods

IN THE 1930's certain nutritional deficiencies were found to be prevalent in the United States. Alert food processors began adding synthetic vitamins to their products, but with little or no scientific guidance. In 1940 the Food and Nutrition Board of the National Research Council was organized. This board and the older Council on Foods and Nutrition of the American Medical Association have issued statements regarding the addition of specific nutrients to foods from time to time. In November, 1953, they reconsidered past statements and issued a joint statement that, although in no way a directive, should serve as a valuable guide.¹

Provisions of Endorsement

The report endorses in principle the addition of specific nutrients to certain staple foods provided (1) there is a clear indication that probable advantage will result from such

an addition, (2) the food item concerned is an effective vehicle of distribution for the additive, and (3) such addition would not interfere with the achievement of a diet good in other respects. The report further stresses the desirability of meeting the nutritional needs of the people by the use of natural foods insofar as possible.

Recommendations

1. It recommends that foods chosen as vehicles for the distribution of additives should be, when practicable, those that have lost nutrients through refining or other processing.

2. It approves the addition of greater than natural levels of nutrients to foods that are suitable vehicles of distribution when other methods for effecting the desired distribution appear to be less practicable.

3. It recommends considering the restoration of essential nutrients should future technologic and economic developments lead to extensive reduction in the consumption of some staple articles of diets.

4. The report approves the enrichment of flour, bread, degerminated corn meal, and corn grits with thiamine, riboflavin, and niacin; the nutritive improvement of whole grain corn meal and white rice; the retention or restoration of thiamine, niacin, and iron in processed food cereals; and the addition of vitamin D to milk, vitamin A to butter and margarine, and iodine to table salt.

Limits Necessary

It is necessary to set definite limits to the addition of nutrients to food products in order to protect the public from combinations that are irrational or even harmful. Most states have based their laws on the recommendations of the Food and Nutrition Board and the Council on Food and Nutrition. There is good evidence that the policies recommended have benefited the public and have encouraged sound nutritional practices.

Adapted from Editorials and Comments, *Journal of the American Medical Association* 155:127 (May 8) 1954.

¹The Addition of Specific Nutrients to Foods, Pub. Health Rep. 69:275-276 (March) 1954. A Statement of General Policy Concerning the Addition of Specific Nutrients to Foods, report of the Council on Foods and Nutrition, JAMA 154:145 (Jan. 9) 1954.

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Some Diagnostic Points

in ROENTGENOGRAPHIC INTERPRETATIONS of Upper Third Molars

HERMAN BRODY, D.M.D., Springfield, Massachusetts

DIGEST

The roentgenogram of the upper third molar is not as clear and sharply defined as the shadow picture of the lower third molar.¹ This is mainly because the malar bone produces a radiopacity over a large area, while the maxillary sinus, on the other hand, presents an extensive radiolucent field which confuses interpretations of periapical conditions. In addition, the coronoid process of the mandible is frequently superimposed in the picture. Despite confusion in the roentgenogram, it still remains a valuable aid in diagnosis and is extremely useful in planning a surgical operation in this area.

Roentgenograms an Aid to Diagnosis

Some diagnostic points to be interpreted from roentgenograms are the following:

1. Deviations of the position as compared with its normal position (Figs. 1, 2, 3, and 4).

(Upper third molars may occur impacted, inverted, in buccal and lingual deflections as well as in torsion.)

2. The position in relation to the second molar (Figs. 5, 6, 7, 8, and 9).

(Roentgenograms clearly show the position of the long axis of the impacted upper third molar in relation to the long axis of the second molar. These positions have four principal classifications: (1) vertical, (2) mesioangular, (3) distoangular, and

(4) horizontal. Occasionally, some impacted third molars are buccoangular and linguoangular.)

3. The distance of the crown above the plane of occlusion.

(The relative depth of the upper impacted third molar in bone may be classified as follows:

Class A: The lowest part of the crown of the impacted third molar is on line with the occlusal plane of the second molar (Fig. 10).

Class B: The lowest part of the crown of the upper impacted third molar is between the occlusal plane of the second molar and the cervical line (Fig. 11).

Class C: The lowest part of the crown of the upper impacted third molar is at or above the cervical line of the second molar (Fig. 12).

4. The amount of tooth surface involved if there is contact with the second molar (Fig. 13).

(When an impacted upper third molar occupies a position extremely close to the second molar, utmost care must be exercised to avoid loosening or injuring this tooth.)

Fusion of the third molar with the roots of the second molar is possible; pathologic resorption of the roots of the second molar sometimes occurs.

5. The size of the crown (Figs. 14 and 15).

(To facilitate the removal of impacted teeth, overlying bone must be excised to expose the crown. The larger the crown, the greater amount of bone that must be excised.)

6. The division of fusion of the roots and their curvatures (Fig. 16).

(Upper third molars have fused

roots, divergent roots, extra roots, hypercementosed roots, and roots with partial development. With knowledge of root formation, the removal of these teeth is greatly facilitated.)

7. The available space between the second and third molars (Figs. 17 and 18).

(It is important to determine if there is sufficient space between the second and third molars to permit the application of an appropriate elevator to lift the impacted tooth from its crypt. The space between the distal surface of the second molar and the mesial surface of the third molar varies in size according to the position of the impacted tooth.)

8. The condition of the second molar and the alveolar process supporting it (Figs. 19 and 20).

(As a rule, the upper impacted tooth may be removed without disturbing the second molar. There are times, however, when the second molar is so hopelessly involved with caries or periodontoclasia that it must also be extracted. Before undertaking the removal of an impacted upper third molar, the condition of the second molar should be closely examined.)

9. The proximity of the maxillary sinus (Figs. 21 and 22).

(The upper third molar is frequently near the maxillary sinus and in some cases is separated from it only by a thin membrane or thin shallow bone. For this reason forceps should not be used but the application of a suitable elevator is indicated for the removal of this tooth. The use of forceps is contraindicated except to remove the loosened tooth. Upward pressure should also be avoided to

¹Brody, Herman: Some Diagnostic Points in Roentgenographic Interpretation of Lower Third Molars, DENTAL DIGEST 58:351 (August) 1952.

prevent the tooth from being forced directly into the maxillary sinus.)

10. The presence of pathologic conditions, such as follicular cysts, alveolar abscesses, and circumcoronal infections (Figs. 23 and 24).

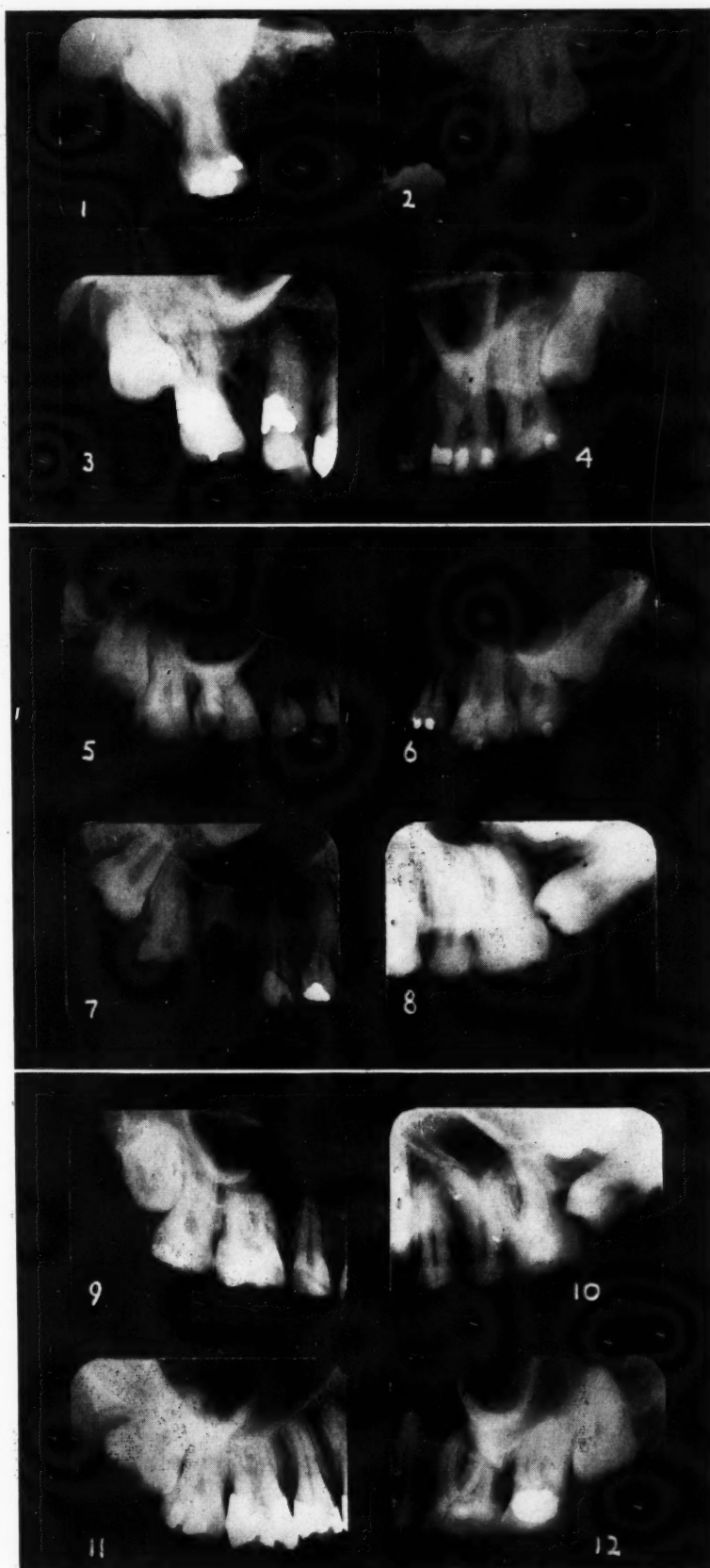
(Pathologic conditions are less frequently found in the areas of upper third molars than in the areas of impacted lower third molars. The symptoms of upper impacted third molars are often of the neurologic than of the inflammatory type.)

11. The proximity to the hamular notch (Figs. 25 and 26).

(When the upper impacted third molar is close to the hamular notch, the force should be applied according to the deflection, buccally or lingually rather than distally. Extreme care should be exercised to avoid injury to the hamular process or the internal or external pterygoid plates. Careful and cautious surgery is also indicated to prevent the third molar from being forced into the sphenomaxillary space.)

12. Caries and the third molar (Figs. 27 and 28).

(The upper third molar is often hypoplastic and susceptible to dental caries. The position of the tooth in



1. An inverted impacted upper third molar in close proximity to the hamular notch. Note the hamular process.
2. A vertical impacted upper third molar. The contour of the distal surface of the second molar contributes to its impaction.

3. An impacted upper third molar with a marked buccal deflection.

4. A mesioangular impacted upper third molar in close proximity to the hamular notch.

5. A vertical impacted upper third molar in close proximity to the maxillary sinus.

6. A mesioangular impacted upper third molar.

7. A distoangular impacted upper third molar.

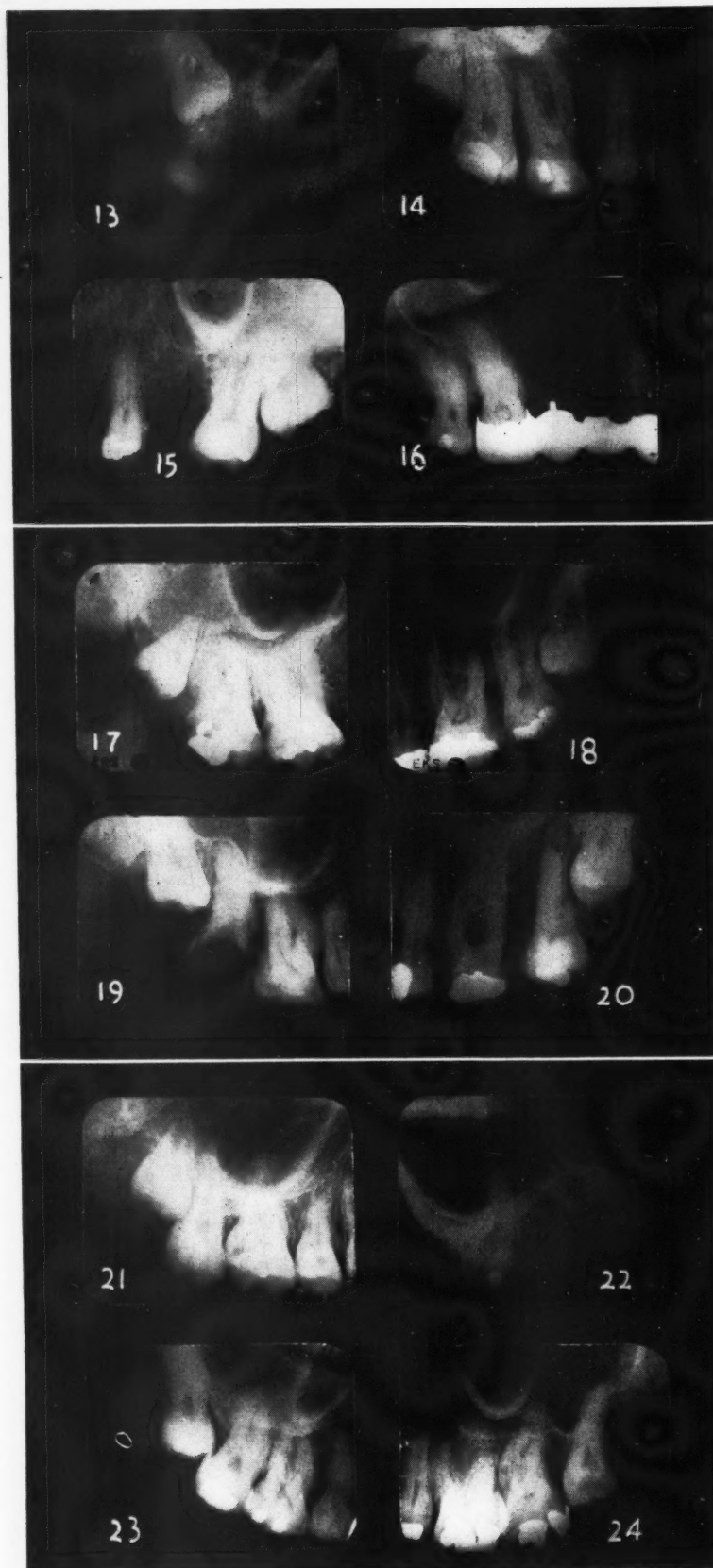
8. A horizontal impacted upper third molar.

9. A buccoangular impacted upper third molar.

10. Class A impacted upper third molar.

11. Class B impacted upper third molar.

12. Class C impacted upper third molar.



the mouth renders its cleansing quite difficult. For these reasons, it is extracted more frequently than any other tooth in the maxilla.)

13. Embedded upper third molars (Figs. 29 and 30).

(Frequently, in our dental practice, patients present themselves with irritations under dentures which they have worn in comfort for years. A roentgenogram will usually reveal an embedded tooth which is the causative factor. Embedded teeth should be removed to relieve such irritations.)

Conclusion

Because roentgenograms accurately record the condition of the hidden section of the teeth and jaws, roentgenology is accepted by the dentist and patient as the most effective

13. The crown of an impacted upper third molar in contact with mesiobuccal and distobuccal roots of the second molar.

14. A vertical impacted upper third molar with small crown.

15. A distoangular impacted upper third molar with larger crown.

16. An upper third molar with small crown and fused roots distally inclined. This tooth was affected with a severe parietal abscess.

17. A distoangular upper third molar with sufficient space between the second molar to permit the application of an appropriate elevator to remove the tooth.

18. A mesioangular impacted upper third molar with insufficient space between the second molar for the application of an elevator.

19. An upper second molar adjacent to an impacted mesioangular upper third molar. Its crown is notably invaded by dental caries.

20. Upper first and second molars affected with advanced periodontoclasia. The impacted tooth is vertical.

21. An upper vertical impacted third molar in close proximity to maxillary sinus.

22. An upper distoangular impacted third molar with roots penetrating the maxillary sinus.

23. A mesioangular impacted upper third molar showing evidence of pericoronal infection.

24. A mesioangular impacted upper third molar with roots in close proximity to the maxillary sinus. The tooth was affected with severe circumcoronal infection.

25. A distoangular upper third molar in close proximity to hamular notch.

26. A mesioangular upper third molar in close proximity to hamular notch.

27. An upper third molar severely affected with dental caries.

28. An upper third molar with a large carious lesion.

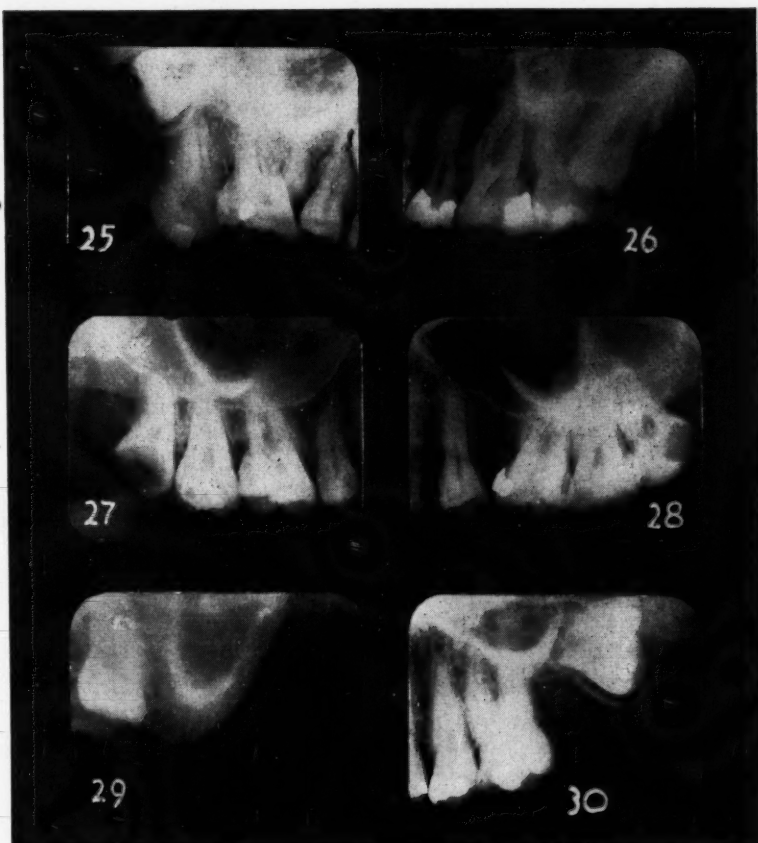
29. An embedded upper third molar which was under a comfortable denture for several years.

30. An embedded upper third molar which apparently was the cause of severe neuralgic pains. The roentgenogram shows evidence of a small follicular cyst.

method of extending the clinical examination.

Proper and complete roentgenograms and a thorough knowledge of their interpretation are, therefore, essential for success in operations for removal of upper third molars.

1597 Main Street.



Endameba in the Mouth

Problem

Can amebic dysentery cause swelling, soreness, or infection to the salivary glands or any of the ducts (Wharton's and Stensen's)?

Discussion

No records are available to indicate that *Endameba histolytica* may cause swelling, soreness, or infection to the salivary glands or any of the ducts (Wharton's and Stensen's). However, *E. gingivalis* may be found in material obtained from these sources. *E. gingivalis*, a

parasite of the mouth of man, is often found in gingival tissue around the teeth in small numbers even in healthy mouths. It is found in large numbers in pyorrhea alveolaris, gingivitis, and caries and in the tartar of teeth. The living trophozoites of *E. gingivalis* closely resemble *E. histolytica* morphologically and in the character of their movements, but are not known to encyst. The ingested masses in the living trophozoites resemble red corpuscles, but they are believed to be residual nuclear material from digested leukocytes.

It has not been possible to establish the etiologic relationship of this parasite to pyorrhea and dental caries. Recently Sutcliffe and associates reported two cases of pulmonary suppuration in which *E. gingivalis* was found in purulent material from the bronchi. In one of the two cases material was obtained from the bronchi through a bronchoscope (*Am. J. Trop. Med.* 31:718-723, 1951).

From Queries and Minor Notes, *Journal of the American Medical Association* 155:325 (May 15) 1954.

BLOOD and URINE Findings

Associated with Periodontitis

H. G. MARQUEZ, Ph.D., San Francisco

DIGEST

The purpose of the studies reported herein is to continue the investigation undertaken at San Quentin prison twelve years ago by the Research Group of the California Academy of Periodontology. The object of the San Quentin investigation was to demonstrate by experimentation relationships, if any, between disease of the mouth and certain systemic conditions. In that particular approach, only those systemic conditions were considered which might result from periodontal infections and the existing health state after such oral infections had been eradicated.

Method of Study

The part assigned to the author in this project was the study of the blood and urinary findings in the cases under observation. The blood of each patient was evaluated and classified according to the Schilling hemogram.

Use of Mathematical Devices—The study was simplified by using a mathematical artifice whereby a single numerical factor could be obtained from the interrelation between the various neutrophilic components in a single blood differential count.

Accepted Normal Index—In the Schilling hemogram the accepted normal index is 4 per cent stab cells and 64 per cent segmented cells in 100 white cells. If the stab cells or other nonsegmented neutrophils are divided by 64 and then multiplied by the factor 16, the following equation results:

$$\begin{array}{rcl} 4 \times 16 & = & 64 \\ \hline 64 & & 64 \end{array} = 1$$

The accepted normal index is therefore 1. From this artifice it is immediately obvious that the higher the multiple index, the more severe is the neutrophilic shift; that is, the greater the hematopoietic activity.

Left Neutrophilic Shift

Observation pointed to the fact that every one of the blood specimens studied from patients with frank periodontal infection displayed decided regenerative left neutrophilic shift, a Schilling shift of chronic irritative base. In subsequent studies, up to the present, the neutrophilic behavior has been found to adhere to the blood pattern noted among the San Quentin inmates with paradentosis.

Preponderance of Toxic Neutrophils—In the investigation at San Quentin it was also noticed that the blood examined in the cases of periodontosis showed a significant preponderance of toxic granules in the neutrophils.

Neutrophilic Granules—Description

Toxic granules are large irregularly clumped granules in the cytoplasm of neutrophils. These granules are seen under certain conditions as, for instance, in severe bacterial invasion.

Italian Investigation—As early as 1900 various Italian scientists called repeated attention to changes in the cytoplasm of cells as well as changes in nuclear forms of the neutrophils. Cesaris-Demel, attempting to draw clinical conclusions from these changes, assumed that they were degenerative.

German Studies—Herschfeld was the first German authority to speak of this finding. Subsequently, Schilling, Gloor, and Naegeli gave their

interpretations on these changes. Thirty years afterward Barta reported a complete study of the nature of these neutrophilic granules. These German authorities, however, differed widely in their views concerning the origin and mechanism of these granules.

Importance in Diagnosis and Prognosis—Gradwohl cuts through this knot of differences of opinion by saying that regardless of the controversy concerning the nature of toxic or pathologic granules of leucocytes, how important are they in diagnosis and prognosis?

Gradwohl contends that they are particularly important in the diagnosis and prognosis of staphylococci and streptococci sepsis.

Possible Metastatic Process—Gloor maintains that the presence of these granules in blood smears in staphylococci infections indicates a flooding of the system or a metastatic process. Should this view become tenable by virtue of strong experimental evidence, the presence of these toxic granules in the cytoplasm of neutrophils would have a high degree of diagnostic and prognostic implications.

Additional Claims—Gloor further reports a great difference in the number of toxic granules in widespread streptococci sepsis and endocarditis lenta, extremely few being present in the latter, many in the former. He claims that the greatest number of toxic granules are seen in croupous pneumonia.

Verification—Gloor's observation has been repeatedly verified by contemporary hematologists.

Phagocytic Reaction Suggested—Barta's conclusions are that these granules indicate a humoral or phagocytic reaction, that they do not parallel the clinical symptoms, but are subordinate thereto. Of course, esti-

No.	Degree	Gingivitis Location	W.B.C. per 1000	Multiple Index	Per Cent Toxic Granules	Type of Granules Fine	Coarse	Indicanuria
1	Slight	General	7.8	2.57	82		X	X
2	"	Post	9.4	3.21	91		X	XXXX
3	"	"	8.8	2.05	15		X	X
4	X	"	8.9	1.87	20	X		—
5	X	"	7.8	1.5	0			—
6	X	General	9.8	3.0	40		X	—
7	—	—	8.2	1.7	2	X		—
8	Slight	Post	7.8	2.5	12	X	X	
9	X	U.R	6.8	3.2	2	X	X	XXXX
10	Marked	General	7.8	3.5	20	X	X	XXXX
11	X	Post	7.8	2.0	2	X		XX
12	—	—	6.8	1.15	2	X		—
13	X	L.P	8.4	3.85	48	X	X	—
14	X	L.A	8.2	3.12	42	X	X	—
15	X	General	8.2	2.0	3	X		XX
16	—	—	8.0	1.15	22	X	X	—
17	—	—	9.0	1.2	12	X		—
18	X	General	7.1	1.35	—	—	—	X
19	X	General	7.84	2.85	—	—	—	XXXX
20	X	Post	9.8	3.6	6	X		XX
21	—	—	6.84	2.0	—	—	—	—
22			7.8	3.0	5	X		
23	—	—	7.8	1.6	28	X		—
24	—	—	6.4	1.2	2	X	X	XXX
25	X	General	7.88	3.45—	22	X		XXXX
26	X	Post	7.2	1.45	—	—	—	—
27	—	—	8.8	3.25	35	X	X	—
28	—	—	8.2	2.0	1	X	X	—
29	X	General	7.2	1.12	—			X
30		—						
31	—	—	7.4	1.85	—			XX
32	X	Post	9.0	2.97	22		X	XX
33	X	Post	8.8	1.86	—			X
34	X	General	7.8	1.22	—			—
35	X	Post	9.4	1.08	15	X	X	X
36	X	General	7.8	1.42	—			—
37	X	Post	8.8	2.87	12	X		—
38	X	General	7.8	1.60	—			XXX
39	X	Post	8.0	1.82	—			—
40	X	General	9.40	3.33	18		X	XXX
41	X	General	8.5	3.27	74		X	X

X Very slight.
L.P Lower posterior.
L.A Lower anterior.

General generalized.
U.R Upper right.

mation of these granules does not, and can not be, a substitute for the blood evaluation, but serves to extend it. It is apparent that with clinical symptoms and tests combined these toxic granules may be used to complete the diagnostic and prognostic summation in a given case.

Relation of Toxic Granules to Periodontal Conditions

In the earlier approach at San Quentin it was indicated, although casually, the comparative incidence of these granules before and after operation in periodontosis. In the present approach the attempt is made to study the relation, if any, of these toxic granules with periodontal cases. In the 100 selected cases of Paul Boyens,¹ showing frank or typical periodontitis, 71 of these showed toxic neutrophilic granules, and 54 exhibited definite left neutrophilic shift of focal irritative base.

Study Conducted—The study of the incidence of toxic neutrophilic granules was continued among students of the College of Physicians and Surgeons. It was possible to observe only forty cases. To obviate personal equation in the study, cases were examined clinically by different clinicians and their conclusions were submitted independently to the research group where they were correlated with the laboratory results in blood, and urine.

Independent Research—All the examinations were completed independently and data on each case were not correlated until all the results had been submitted for compilation. The results are tabulated in the accompanying chart.

Toxic Granules Frequently Found

Students for the study were selected at random without reference to the

buccal conditions which might be present. Of the 40 cases selected, 38 students were completely studied, so far as their dental and laboratory tests were concerned, with the following results:

(1) Ten cases were free from any dental or gingival lesions.

(2) Twenty-eight cases showed periodontitis of varying degrees.

(3) In many of the cases toxic granules in varying percentages were present in blood smears.

(4) Twenty-six blood smears showed toxic granules in the neutrophils; the remaining 12 failed to disclose the presence of these granules.

(5) It was noted that there was no consistency in the presence of neutrophilic granules in the blood of those with frank periodontitis; in fact, neutrophils with toxic granules were noted in cases of negative gingival conditions.

Percentage of Concordance Significant

A significant percentage of concordance was reported between the results of blood examination and the clinical findings. By concordance is meant, in this instance, agreements and disagreements of findings.

Examples—(1) If toxic granules were present in a case of clinically demonstrated periodontitis, the case is considered as positive concordance, as is negative periodontitis with absence of toxic granules in the neutrophils. (2) Where the reverse is true, that is, in the presence of periodontitis without neutrophilic toxic granules being present, the situation is considered as negative concordance, as is normal gingiva with the presence of neutrophilic toxic granules in the blood smears.

Incidence—It is noted that there were 23 positive concordances and 15 negative ones, giving a percentage of 60.53 positives and 39.47 negatives (see chart page 315).

High Multiple Index—It will be noted that, as in the result obtained in the San Quentin studies, there is evidence of a comparatively high multiple index in the cases of positive periodontitis.

Indicanuria Observed—Because it was postulated that in the pathologic process of periodontitis some bacterial putrefactive process occurs, the incidence of indicanuria in all the cases was also studied. Again it was noted that there was no absolute consistency in the correlation of indicanuria and periodontitis. Resorting to the concordance percentage, it was found that out of these 38 cases there were 27 positive concordances and 11 negative ones, yielding a 71.05 per cent positive against 28.95 per cent negative. In the 100 private cases of frank periodontal lesions, 98 gave positive indicanuria in varying amounts.

Conclusions

From the results described, it would seem that blood and urine studies in gingival lesions may well be used in diagnostic summation. It is also obvious that further studies would have to be carried out in order to determine, if possible, whether these laboratory findings have any prognostic implications.

Summary

1. Toxic granules in the neutrophils and incidence of indicanuria were studied and correlated in relation with periodontitis.

2. Some views were given regarding neutrophilic granules.

3. An arithmetical artifice was employed in arriving at multiple indexes and concordance percentage.

4. There seems to be significant concordance between the presence of neutrophilic toxic granules and indicanuria in cases of periodontosis.

231 Ellis Street.

¹Boyens, Paul J.: Intestinal Toxemia and Periodontitis, DENTAL DIGEST 60:223 (May) 1954.

The EDITOR'S Page

IN RECENT years through the work of Selye¹ particularly, the concept of stress as a factor in disease has been given increased attention. For years, within the dental field, the recognition of stress has been considered by prosthodontists, periodontists, and orthodontists. The mechanics of stress, however, are somewhat different from the biologies of stress. The dentist has thought of stress primarily as a localized mechanical interaction between a force and a resistant. The biologist considers stress as an overall reaction of an organism. The manner in which the organism as a whole reacts to a localized stressor should be a matter of concern to dentists.

To clarify this difference between mechanical stress and biologic stress it may be helpful to define the terms.

Mechanical stress: "Mutual force or action between contiguous surfaces of bodies, or on both sides of any arbitrary section line or surface, caused by external force, as tension, compression, shear, or a combination of these; the cohesive force or molecular resistance in a body opposing such action."

Biologic stress: "The sum of all nonspecific biologic phenomena (including damage or defense). It may be local or topical (as exemplified by inflammation) or systemic (as exemplified by the General Adaptation Syndrome)."

The stresses that dentists contend with are mechanical in nature and the reactions are biologic. For example, the tooth stressed by supra or traumatic occlusion is subject to an increased physical load. The tooth may react in several ways. It may become sore or loose; or the supporting tissues may undergo changes by inflammation; or bone sclerosis or dissolution may result. The chain of events from overloading vary widely in time and severity. One tooth reacts violently to a small increase in load with inflammation, soreness, pocket formation, increased mobility, bone destruction, all occurring in

a short time interval. Another tooth may be overloaded for years with all manner of strains and functional interference but without signs or symptoms of disease. In fact, every clinician has observed conditions of overloading where the supporting bone was *increased in density*.

Why the tissues vary so widely in their reactions to stress has never been explained satisfactorily. These variables in vital response are at the basis of life itself. Why one total organism or one tooth runs a rapid course from initial irritation to dissolution and death and another person or tooth has fabulous powers to resist irritation are among the riddles of biology.

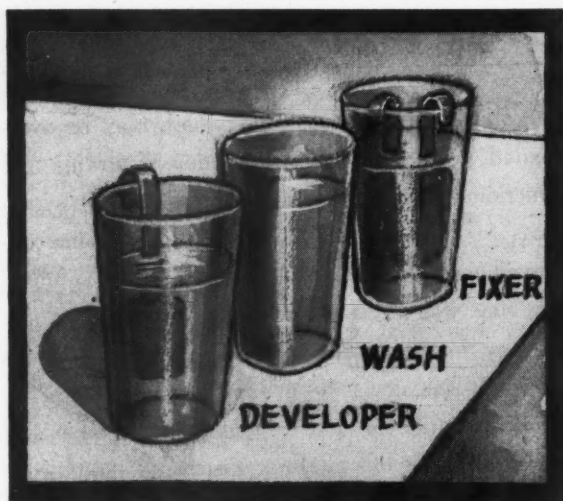
The concept of a General Adaptation Syndrome (G-A-S) as formulated by Hans Selye is a brilliant attempt to explain how the organism reacts to a *nonspecific stress*. Bacterial infection, trauma, nervous strain, chemical irritants, extremes of temperature have *different specific actions* in the organism. In addition, however, all these forms of irritants initiate a nonspecific reaction superimposed upon the specific effects. This general reaction is called by Selye the General Adaptation Syndrome. It is made up of these components:

1. The *alarm reaction* in which adaptation has not yet been acquired.
2. The *stage of resistance* in which adaptation is optimal.
3. The *stage of exhaustion* in which the acquired adaptation is lost again.

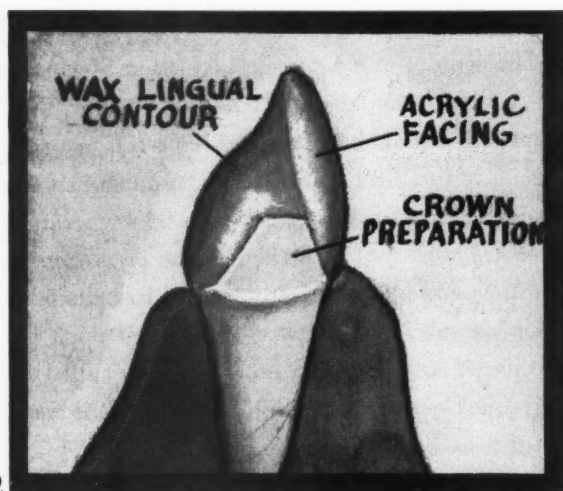
An entire new world opens to us when we contemplate what may happen to an organism that responds in an overwhelming, overall, organismal, nonspecific way to a specific stress that originated in local tissue—the dental tissues, for example.

In terms of future research Selye expresses these profound words: "We must learn to imitate—and if necessary to correct and complement—the body's own autopharmacologic efforts to combat the stress factor in disease."

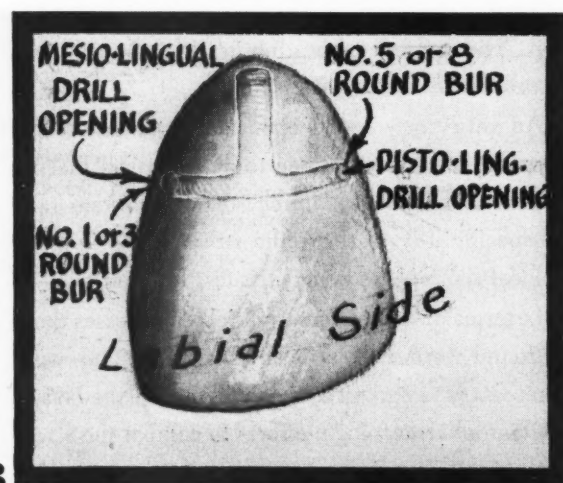
¹Selye, Hans: Role of Stress and Adaptive Hormones in Dental Medicine, Oral Surg., Oral Med., and Oral Path. 7:365 (April) 1954.



1



2



3

Clinical and Laboratory Suggestions

X-ray Processing

R. S. Cooper, D.D.S., Paducah, Kentucky

1. When one or two x-rays are needed for diagnosis, three glass tumblers may be used to hold the solutions. This is more convenient and more economical than using the large developing tank.

Modified Acrylic Jacket Crown

Michael O'Doherty, Dublin, Eire

2. Select a stock acrylic tooth of proper size and shade. Preserve the labial portion and build up the lingual contour with wax. Flask the pattern and process in acrylic.

Mechanical Retention for Plastic Teeth

Louis M. Fleisch, D.D.S., Topeka, Kansas

3. An effective and practical means of securing mechanical retention is to drill in the lingual surface of plastic teeth to those found in diatomic porcelain posterior teeth. The holes drilled in the mesial and distal add retention. They also allow the air to escape permitting the acrylic to fill the entire space.

READERS are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10.00 on publication.

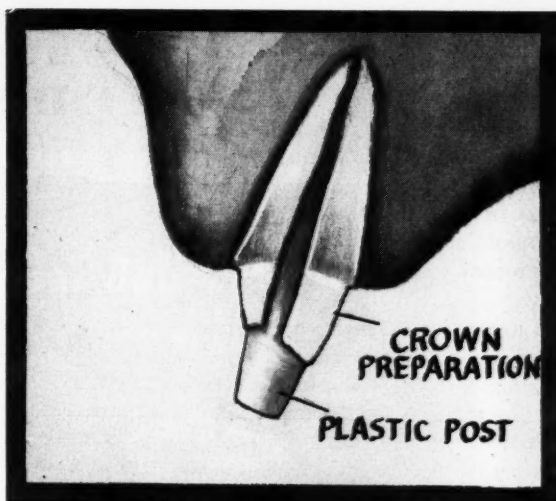
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

A Post Crown

Julius Jussim, D.D.S., New York

4. The root is prepared as for a full crown. A plastic toothpick is covered with a soft mix of self-curing acrylic and inserted into the post hole. Remove the acrylic before it has begun to set. After it has hardened, insert and trim to proper form. Using this acrylic as a pattern, make a gold casting.

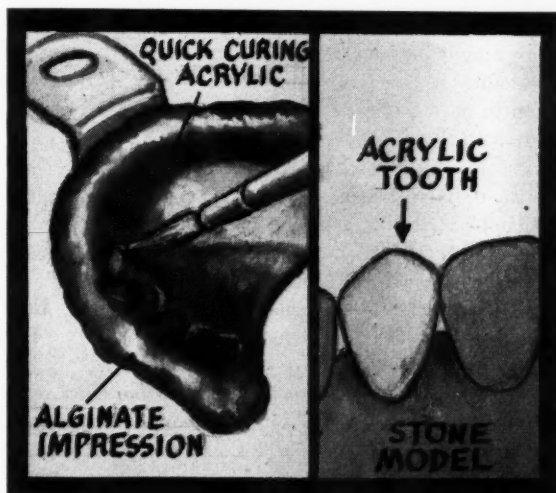


4

Tooth Duplication for a Temporary Partial

Edwin T. Coleman, D.D.S., Knoxville, Tennessee

5. Secure an alginate snap impression before the tooth is extracted. Paint in the proper shade of quick-curing acrylic. Fill only to the gingival of the tooth that is to be replaced. Pour the rest of the impression in stone. Process the partial in the regular manner. The quick-curing acrylic tooth will form a bond with the acrylic base material.

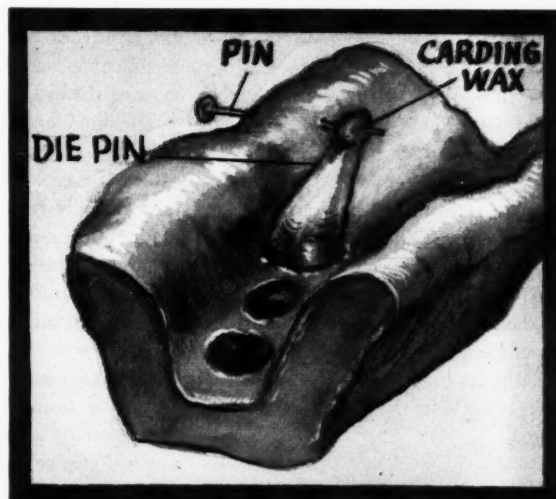


5

Stabilizing Die Pins in Hydrocolloid Impressions

Hugh A. Alexander, D.D.S., Greenville, Mississippi

6. When die pins are required for removable dies and must be held at an acute angle to permit later withdrawal, they are secured with a straight pin through the periphery of the impression and stuck into a ball of wax on the end of the die pin.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 330 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.



Exertion vs. Coronary Thrombosis

There is some difference of opinion among clinicians as to whether or not exertion precipitates coronary thrombosis. In an effort to learn more about the problem a well-supervised series of observations was made of 96 patients.

These patients experienced 100 attacks. The activity preceding and coinciding with the attack as well as the time of day of the attack was carefully noted. It was particularly noted whether the activity at the time of the attack departed in any way from the person's normal activity for that time of day on that particular day of the week.

Some patients insisted that exertion precipitated the attack. However, questioning revealed (1) that the exertion in most instances was not unusual, (2) that at times it occurred hours before the attack, (3) that there was no discomfort during the exertion, and (4) that actually the attack came on while the patient was at rest.

In only three of the 100 attacks was the patient engaged in unusual exertion when the attack occurred. One of these was lifting a heavy object out of his car when the attack occurred, but he did this about once a week. Six months later he had a second attack that came on at 2 a.m. and awakened him out of a sound sleep. Another was on his vacation and was walking up a steep grade when the attack occurred. This patient had a second attack nine months later at 3 p.m. on a Saturday afternoon while lying in bed. The third had his attack about 10 minutes after he had engaged in a rather heated argument; it was learned that heated arguments were a part of his daily routine.

As a rule, the attacks were evenly divided between the working and leisure hours. These findings strengthen the belief that attacks of coronary thrombosis will occur at any time day or night, and are in no way related to the person's activity or emotional state.

Richardson, J. L.: Does Exertion

MEDICINE

and the Biologic Sciences



Precipitate Coronary Thrombosis? Georgia Med. A. J. 42:89-92 (February) 1953.



Eye Changes in the Aged

The chief ophthalmologic problem of advanced age is lessening or distortion of vision. Senile cataract and senile macular degeneration are the chief factors responsible for macular degeneration. Characteristic alterations which occur in the eyeball adnexa involving diffuse atrophy of the fatty, fibrous and elastic tissues are responsible for the changed appearance of the eye in the aged.

The incidence of senile cataract probably starts from zero at the age of 40. It rises slowly at first and then more rapidly reaching a frequency of about 50 per cent at age 80. Senile cataract represents the most easily noticeable manifestation of a rather widespread involutional process due to age.

Age is no bar to cataract surgery. Operative lesions, while located for the most part in avascular tissue, heal as readily in persons at age 85 as they do in persons at age 65. Postoperative

complications have been rare since the introduction of corneoscleral sutures, antibiotics, and early ambulation.

One of the major problems of the elderly aphakic patient is adjustment to his corrective lenses. These lenses profoundly distort the patient's concept of the outside world because of the enlargement of retinal images by the cataract lenses. Mastery of this distressing difficulty is achieved when the patient learns to hold his eyes motionless, fixing his gaze through the optical center of the correcting lenses, and moving his head slowly to look at any object not in his direct view. This simple trick, once mastered, eliminates spherical aberration.

Senile macular degeneration presents a less encouraging outlook than senile cataracts. While total blindness does not occur, a central scotoma of varying size is a major handicap. Because of the unusually high circulatory requirements of the retina and the sclerotic and progressive nature of the disease, treatment is extremely unsatisfactory. Since vasodilators and ACTH or cortisone may bring temporary improvement without changing the outcome, these drugs are not indicated. Microwave diathermy has been found of value.

Presbyopia is not a clinical problem peculiar to old age. This process begins at birth and continues at a steady rate. The underlying process is the hardening of the central or oldest part of the crystalline lens, which gradually increases the load against which the muscle of accommodation must work.

Kronfeld, Peter C.: Eye Changes Due to Advanced Age, Illinois M. J. 103:104-107 (February) 1953.



Sore Mouth

Many oral lesions are associated with systemic disorders. The characteristics of the local processes may suggest the basic general disturbance.

Lesions of the lips may be congenital or acquired. Congenital lesions consist of such anomalies as: (1)

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harelip, (2) persistent infantile frenum, and (3) Fordyce's disease, a condition in which enlarged sebaceous glands in the mucosa of the lips, cheeks, and gingivae appear as yellowish milium-like bodies. Acquired disturbances are: (1) macrocheilia, swollen lip resulting from trauma, allergy or a systemic disease; (2) cheilitis, caused by nutritional deficiency or allergic reaction; (3) perleche, a regional streptococcal infection; (4) herpes; (5) eczema; (6) precancerous keratoses; and (7) pyogenic as well as nonpyogenic infections. Frequently a biopsy is necessary before definitive diagnosis of a lip lesion can be made.

Other structures in the mouth may be involved simultaneously with disease of the gingivae, as in Vincent's disease. Systemic as well as local symptoms are usually noted. Other forms of gingivitis are related to endocrine and metabolic disturbances or to nutritional inadequacies.

Inflammatory enlargements of the gingivae include abscesses and tumor-like growths. An epulis is a proliferative mass, it is not neoplastic and is usually situated in the gingival area of a patient with teeth. A ranula is a cyst in the floor of the mouth forming as a result of the blockage of a mucous or salivary gland.

Nearly all diseases of the oral mucous membranes may produce "sore mouth." These lesions may be the first obvious manifestations of syphilis, cancer, tuberculosis and blood dyscrasia. The nutritional and infectious aspects of catarrhal, aphthous, ulcerative, infectious, gangrenous, membranous, mycotic and herpetic stomatitis must be considered in order to apply appropriate therapy. Biopsy is often necessary to diagnose tuberculous stomatitis.

In cases of viral stomatitis, generalized symptoms are invariably present. Oral lesions of various kinds complicate measles, scarlet fever, chickenpox, diphtheria and even typhoid fever. Lesions of the gums and tongue are commonly found in diabetic patients because of the predisposition to infection.

With pernicious anemia, a sore

tongue is the cause of a sore mouth. Pallor and bleeding of the oral mucosa are typical of the secondary anemias. Most mouth lesions of leukemia are edematous and ulcerative. The gingivae are usually edematous and swollen. Eventually necrosis occurs.

Stomatitis may also be produced by (1) improper use of a toothbrush, (2) trauma from chicken or fish bones, (3) hasty swallowing of hot foods, (4) excessive tobacco smoking, and (5) undue galvanic or irradiation exposure.

Hollender, A. R.: *Sore Mouth, Eye, Ear, Nose & Throat Monthly* 32:28-35 (January) 1953.



Pregnancy and Poliomyelitis

The pregnant woman is no more susceptible than the nonpregnant woman. Acute anterior poliomyelitis, however, contracted during pregnancy is a much more fatal disease.

Of the cases of poliomyelitis occurring during pregnancy, two-thirds occur between the ages of 20 and 29. Three-fourths of the patients are having a first or second pregnancy.

Susceptibility to poliomyelitis does not vary with the stage of pregnancy. Mortality is much higher, however, during the last trimester and in the immediate puerperium. The period immediately after delivery is the most critical. Twelve per cent of the maternal deaths occur in this small group which comprises only about 3.5 per cent of the total cases of poliomyelitis associated with pregnancy. Pregnancy wastage occurs in one-third of the cases.

Poliomyelitis has little effect on uterine activity or development and adds no undue obstetrical hazard. The first and second stages of labor progress normally. The complications of the third stage and immediate puerperium are the same as for healthy women.

During the last trimester, the large uterus may impose a considerable burden upon respiratory exchange

which may be already embarrassed by excessive tracheobronchial secretions or by bulbar involvement. Tracheotomy should be used early and freely.

Any time after the thirty-second week of gestation, cesarean section may be lifesaving. It should be performed regardless of prematurity when suction and tracheotomy do not relieve the respiratory difficulties.

Local anesthesia is preferred when feasible or when respiration is impaired. Caudal and spinal anesthesia must not be employed in cases of poliomyelitis. When the respiration of the patient is satisfactory, labor and delivery may be permitted to progress as usual, sometimes assisted by small amounts of cyclopropane-oxygen mixtures.

Poliomyelitis can be transmitted across the placental barrier. When the disease is acquired in the neonatal period the transmission is possible by maternal contagion. Isolation methods should be diligently practiced. Rooming-in is always unsatisfactory in such cases.

When the mother is stricken with poliomyelitis in the first or second trimester, babies delivered at or near term are distinctly underweight for that period of gestation.

The over-all mortality rate is higher during pregnancy, but if the patient survives, the chances of residual paralysis are no greater for the pregnant than for the nonpregnant patients.

Bowers, Victor M., and Danforth, D. N.: *The Significance of Poliomyelitis during Pregnancy*, *Am. J. Obst. & Gynec.* 65:34-39 (January) 1953.



Surgery in Peptic Ulcer

About 85 per cent of patients with peptic ulcer can be treated satisfactorily by medical means. The remaining 15 per cent are best treated by surgical intervention. This group consists of the following: (1) those with complications such as perforations, obstruction and hemorrhage, (2) a small number who will not or cannot

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be rehabilitated by adequate medical therapy, and (3) those whose ulcers are located on the gastric side of the pylorus.

Gastric ulcers differ from duodenal ulcers in many other respects besides location. The hypersecretion of acid gastric juice is four times greater in gastric ulcer than in duodenal ulcer. The average size of the gastric ulcer is five times that of the duodenal ulcer. Both occur at any age but the highest average incidence is in the fifth decade of life for gastric ulcer and in the fourth decade for duodenal ulcer.

By far the most important difference is the danger of malignancy. About 2 to 5 per cent of gastric ulcers may become malignant. And too, the benign ulcer and the ulcerating carcinoma are often indistinguishable.

In middle life a gastric lesion should always suggest carcinoma because of the following factors: (1) gastric carcinoma is the most frequent cancer in man and is four times more frequent than gastric ulcer; (2) 40 to 50 per cent of surgically and histologically verified gastric cancers have an antecedent typical or strongly suggestive ulcer history; (3) in 30 per cent of all cases of carcinomatous ulcers the roentgenologist is unable to state the exact nature of the lesion; and (4) even carcinomatous ulcers will heal temporarily or improve greatly with good medical treatment.

Only one out of every four or five gastric cancers is resectable. Of every 100 patients with gastric cancer that come to the physician only one will be alive five years later. However, 15 to 40 per cent of those who have carcinomatous ulcers and undergo resection will be alive five years later.

A six-week trial of medical treatment, as advocated by some, may result in disaster. Temporary improvement, both clinically and roentgenologically, may lull the patient into false security. Another six weeks may pass or the patient may not be seen for a long period of time; the next examination may reveal an inoperable lesion.

Gastric resection for gastric ulcer results in 100 per cent achlorhydria,



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and gastrojejunal ulcer is practically unknown. The duodenal end, not being involved in any ulceration is easily dealt with. The mortality rate is only from 1 to 2 per cent.

Every gastric ulcer is a surgical problem unless there are definite contraindications to surgery. In the extremes of age and in the few cases in which the benign nature of the lesion is incontrovertible, medical treatment

may be tried for several weeks.

Horwitz, Alec: The Role of Surgery in Peptic Ulcer, Postgrad. Med. 13:391-401 (May) 1953.

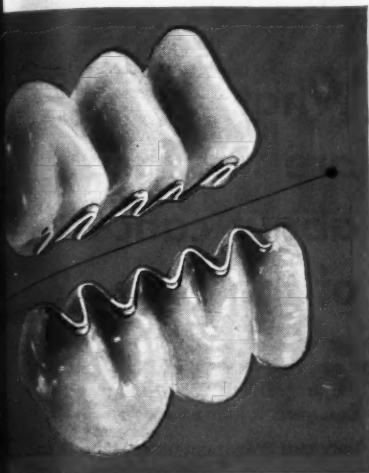


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hair becomes sparse or gray, or both. There are superficial skin changes about the face. The bodily contours change. The age of a person can be estimated with a reasonable degree of accuracy from these changes and other various signs.

When the viscera are exposed, however, and examined with the naked eye or with the lens it is most difficult to determine the age on the basis of

the appearance of the viscera. To readily determine the changes in tissue caused by aging it is necessary to employ microscopic studies and micro-incinerated specimens and the ultra-microscope.

No one dies from true aging. He dies of complications which accumulate with advancing years; the so-called degenerative diseases, such as cardiovascular disease. As aging con-

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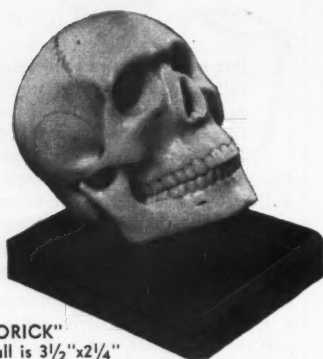
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tinues, microscopic studies of (1) the liver, (2) cardiac muscle, (3) spleen, (4) prostate, (5) fallopian tubes, (6) nasal epithelium, and (7) of the skin show progressive degenerative changes.

Liver cells show polypoid nuclei. This is a situation which results from the loss of the ability of the nuclei to divide, but division of chromosomes is sustained. Some cells are doing nothing at all and have become pyk-

notic. Age pigments have been described in nerve cells, in adrenal gland cells, liver cells, and in heart muscle. Without exception every normal heart after the age of thirty shows varied amounts of this pigment. Fibrosis appears to be a fairly general age change, well illustrated by the changes throughout the body wherein elastic tissue is gradually replaced by fibrous tissue.

In the arterial system the iliacs and coronaries show degenerative changes first. The aorta is rather slow as is the hepatic artery. The pulmonary shows minimal changes, while the cerebral artery closely parallels the iliac arteries. It is one of the most vulnerable of all the blood vessels.

In the eye there is a gradual decrease in the elasticity of the lens. Virtually all elasticity is lost before sixty years of age.

Impairment of hearing for high pitched sounds seems to be a normal physiologic consequence of aging. The average acuity of hearing high tones decreases progressively. The severe impairment of hearing for high tones is said to be due to simple atrophy of the nerve end organs in the basal turn of the cochlea.

The volume of saliva is less and the ptyalin content is diminished in the digestive tract. Achlorhydria in the stomach increases with advancing age. Other secretions diminish throughout the digestive tract.

There is degeneration of elastic tissues and much of the subcutaneous fat disappears. The old person cannot tolerate cold as well as he did when he was younger. Also older people tend to suffer more seriously from extreme heat.

Itching skin is a process which accompanies aging. This probably is related in some way to decreased endocrine function. Speed, strength, and the ability to sustain moderate effort to exhaustion all increase with age to a maximum in early manhood and womanhood and then tend to decline.

Swift, Karl L.: The Effect of Longevity on Basic Structures, J. Michigan M. Soc. 52:499-500 (May) 1953.



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What are the facts about cancer of the lung—?

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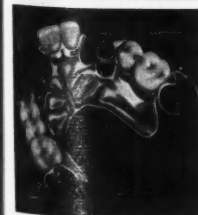
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Easy Does It!

THE SUBJECT of exercise, mentioned before in this column, seems to be a popular one with dentists.

A good many false notions float around concerning the place of exercise in health and well-being. The avowed exercise enthusiast feels that a "workout" is one of the most salutary experiences known to man. To be dripped in sweat and panting for breath is one of his most pleasurable moments. The disdainant of exercise believes that anything that increases his pulse rate one point a minute or that stimulates even the most hyperactive sweat gland to perform a small bit of extra work is an experience to be strenuously avoided.

We must face the reality that some people are constituted by nature for exercise. Others were intended for energy conservation. Sheldon, a constitutional physiologist and psychologist, calls the men of action and muscle the mesomorphs. They are well supplied with bone, sinew, muscle, and blood. They have structures that demand use by exercise. The slender ectomorph and the rotund endomorph of Sheldon's classification were intended for a life of cerebration or for one of luxurious indolence. Neither body type is "better" or "worse" than the other. They are different, because in the mysterious ways of nature they were intended for different purposes.

Most professional athletes are mesomorphs. Most poets and philosophers are ectomorphs. Most jolly good fellows are endomorphs. Nature meant it that way. Too much exercise for an ectomorph may be disastrous if for no other reason than that he does not like exercise. Physical activity for the mesomorph is a necessity. There is no need for us to try to pour our friends into action patterns that do not fit their essential body types. When we try to answer the query, "Is exercise good?" we should qualify it by asking, "Good for whom?"

The studies that have been made on the effects of exercise and health are not definitive. There is a popular notion that the athlete of early life becomes the heart victim of later life and that the intellectual goes on living to the fullness of ripe years.

Those who have not been content to accept these popular clichés and have examined people with a critical eye, find that there is little relationship between athletic activity in youth and an early death or between a laggardly youth and a long life. Under the title, "Brains and Brawn," the *British Medical Journal* of April 3, 1954, covers this subject nicely:

"Anything but sport," said George Bernard Shaw when describing the range of his interests, and he spoke for the large and distinguished company of intellectuals who have drawn the line at most forms of physical exertion undertaken for the mere fun



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Fig. 1

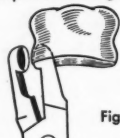


Fig. 2



Fig. 3

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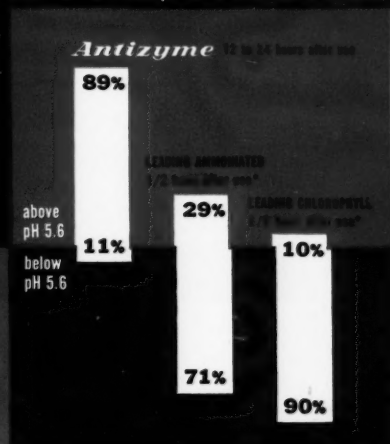
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[†]"A New Approach to the Problem of Dental Caries Control"; *J. Dent. Research* (Aug.) 1963.

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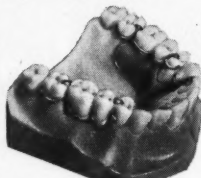


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(See pages 318 and 319)

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of it. But as a freedom-loving man Shaw reserved his censure for 'blood sports'; whatever his private inclinations (and they were certainly not for games) he condemned only the harm done to other men, or more commonly to other animals, and raised no objection to any injury the sportsmen might do themselves. Not all intellectuals have been so tolerant, and some have found reasons, statistical and moral, in support of the old maxim that no one should stand if he can sit or sit if he can lie down. Needless to say there have been other opinions; for each voice which condemned exercise there have been several which defended it, with equal vehemence and possibly more reason.

"In the light of such confident assertions about the advantages and dangers of exercise, it may come as a surprise to the small proportion of people who regard observation as a desirable preliminary to conviction in a matter of this kind to learn that there is really very little evidence. Such evidence as exists concerns mainly the short-term results of exercise, particularly on the cardiovascular system. In the Lumleian Lectures for 1951 Sir Adolphe Abrahams reviewed his extensive experience of the health of athletes and observed pertinently 'that, when death occurs during the performance of physical exertion, two features are as a rule conspicuous: the triviality of the effort, or the discovery of some long pre-existing lesion which had never been suspected.' Most observers are agreed that, although in sick people violent exertion may cause injury and occasionally death, there is no reason to believe that it has any immediate harmful effects on the healthy.

"It has proved more difficult to assess the possibility of delayed effects of exercise. Comparisons have been made between the life expectation of athletes and others; most of them are open to the criticism that the athletes differed from the controls in other ways which might also have influenced their health.

"In our opening pages we publish results of an investigation by Sir Alan
(Continued on page 333)

Rook which meets some of the possible objections to this type of inquiry. His observations are based on Cambridge men who were at the University during the period 1860 to 1900. They were divided into three groups: 'sportsmen,' who represented the University at rowing, cricket, athletics, and rugby football; 'intellectuals,' consisting of men of unusual academic distinction; and a third group selected at random from men not included in the other two. Differences in life expectation between the three groups were trivial, no greater in fact than differences observed between the various classes of sportsmen. In about half the cases it was possible to examine death certificates, and Sir Alan Rook concludes that 'there is . . . little evidence from these figures either that sportsmen are more likely to die from cardiovascular causes than are the controls or that they were affected at an earlier age.'

"To the question whether sportsmen or intellectuals live longer, the answer appears to be that there is very little in it. And this, most fair-minded people will agree, is an equitable result, which is more than can be said for some recent verdicts in the long trial in which the human race has contested with philosophers and more recently statisticians the right to enjoy its few pleasures. The smoker sadly giving up his pipe, the gourmet passing untouched the decanter of port, or the man of 50, with an eye on the statistics of coronary disease, preparing to do three times round the square before breakfast on a winter's morning, may be excused for thinking that generally speaking statistical research workers must be a dour lot, removed from the ordinary temptations of men, and with no other object in life than to dispose of our pleasures one at a time, or destroy all possible satisfaction in them. Let us be grateful then that there is one form of indulgence open to the young in respect of which there is so far no statistical reason why they should not go on doing as they feel inclined. The eighteen young men making their way from Putney to Mortlake this Saturday [the 100th

boat race between Oxford and Cambridge] can enjoy their outing without fear that, win or lose, they will have reason to regret it, while the intellectuals and others who crowd the towpath to watch them can take their vicarious pleasures lightly, comforted by the knowledge that at least so far as their expectation of life is concerned it makes very little difference whether they are on the bank or in the boats."

These remarks do not mean that it is wise for the middle aged person,

which includes everybody past the age of 40, to subject his cardiovascular system to sudden bursts of strain. The blood vessels of many, and probably of most persons past middle life have already begun to become narrowed and incapable of carrying the blood required for excessive physical demands. Although many more people die in their sleep from coronary artery disease than die on the golf course or tennis court, it is good sense for the middle aged

(Continued on page 336)

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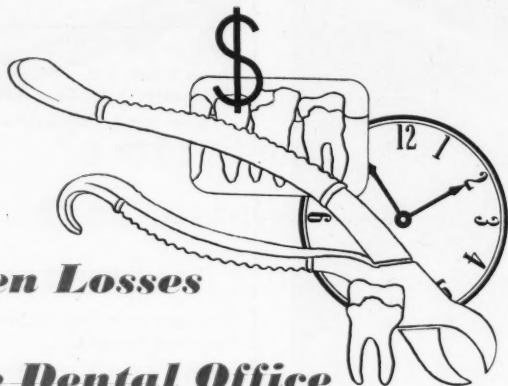
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Hidden Losses

in the Dental Office



"Another's faults we criticize, our own we hide by alibis." But Doctor Leo B. Dillon reverses the procedure and focuses a bright spotlight on some of his own shortcomings, in the hope that other dentists may be inspired to similar self-analysis. Recognizing and eliminating undesirable habits of thought and action may be difficult but it pays off in increased efficiency and peace of mind.

★ ★ ★

Doctor Daniel Klein has an idea that may result in a public education campaign built around the slogan, "People Look at Your Teeth, Do You?" He urges dentifrice manufacturers to join with the dental profession in an integrated plan to present dental treatment to the public as an investment in personal appearance, a beauty treatment of lasting value.

★ ★ ★

"Man of Color," Doctor John Alexander Somerville, was born in Jamaica and is a naturalized citizen of the United States. Living in Los Angeles, he and his wife, Vada, have devoted the greater part of their lives to the welfare of their community and country. Doctor Somerville was

awarded the Order of the British Empire by Queen Elizabeth for his work in furthering Anglo-American relations.

★ ★ ★

Doctor Robert Nemoff, Senior Staff Psychologist, Ohio Penitentiary, discusses "The Compulsive Dental Patient" whom every dentist has probably met at some time in the course of his practice. This type of neurotic person can be a sore trial to the dentist, but, with proper handling, may become a docile, co-operative patient.

★ ★ ★

"It's Not Necessarily Our Money," warns Ernest W. Fair in discussing the taken-for-granted methods of depositing and drawing checks. The deposited check is *not* "money" until it has been cleared through the account of the person or firm whose signature appears on its face.

★ ★ ★

"He Shot His Way to Israel" is the very interesting story of a dentist-marksman, Doctor Irwin N. Tekulsky, who competed in the Maccabiah Games and won for the United States three gold medals (rifle) and a third-place bronze (pistol).

(Continued from page 333)

dentist (all of us past 40) to spare his myocardium the strains of sudden violent exercise. The deliberate, relaxed, easy-does-it forms of activity are considered to be beneficial. The pleasant walk with a good companion will always be one of the most enjoyable forms of exercise.

—E.J.R.

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